AUDIO VISUAL COMMUNICATION REVIEW

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Loran C. Twyford

Profile Techniques for Program Analysis

Robert S. Goyer

Oral Communication: Studies in Listening

C. H. Whelden, Jr.

Using a Film to Teach a Home Nursing Procedure

George Kimball Plochmann

The Feltboard in the Teaching of Logic

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PROFILE TECHNIQUES FOR PROGRAM ANALYSIS

•LORAN C. TWYFORD

This survey and application of a method for appraisal of learning meets certain needs not met by objective tests. The learning profile has merits of speed and ease of application, good reliability and face validity that recommend it to those who must do more than give their opinion about a learning session. Dr. Twyford, previously a research fellow with the Instructional Film Research Program at The Pennsylvania State University, did his doctoral dissertation on learning profiles. He is now employed by the Office of Naval Research at the Special Devices Center which sponsored the research under contract N6 onr 269-7. Applications of the research are being made at the Center in the design of training aids.

DO YOU need to evaluate a television program, film, lecture, or other instructional program? Have you been unable to make the evaluations because of the time required to prepare tests and questionnaires, administer them and analyze the data? If so, the techniques of profile analysis should interest you. The procedure employed in one of the more practical methods in use at the Special Devices Center, Office of Naval Research, is to have 10 persons turn dial knobs during the projection of a film. Each person indicates how much he thinks he is learning from the part of the film being shown. These opinions are electrically summated. This total is available immediately and can be plotted against time or can be noted on the script. The profile obtainable by this method has excellent face validity. Research has shown by way of validation that a person actually is learning when he says he is learning.

The purpose of this article is to give a perspective on the kind of opinion scale one should use, the types of available equipments, and a general estimate of the usefulness of each. General acceptance of the profile method for analyzing programs has been delayed because many kinds of rating scales have been employed, many kinds

of equipment have been developed and used under a variety of circumstances while little has been done to study the advantages of each. Research personnel in exploring the field have invented electrical and mechanical devices to meet specific needs. The type of equipment used is probably not important if cost, maintenance, and ease of operation are acceptable.

One critical element in profile evaluation is the choice of rating scale. This is determined by the objective of the evaluation. The entertainment industry asks how well an audience likes segments of a program or how much interest there is in the program. Likes and interests may not produce any persistent change in the audience. The educator on the other hand is interested in producing learning which can be defined as a persistent change in the number of facts known and the degree to which they are known.

APPLICATIONS OF PROFILE TECHNIQUES

In the profile method of program analysis the program is rated on a rating scale by the audience as the program progresses. A profile is obtained by combining the individual ratings of the raters and plotting their sum on the time axis. Differences in program content during peaks and valleys are compared to discover ways to improve the program.

Improvement of program content by removing sections having low profile amplitude and increasing the amount of program content producing profile peaks has been employed by Hallonquist (6). He made extensive analyses of radio programs in the Program Analysis Division of the Columbia Broadcasting System. Hayes (9) and Paul (12) analyzed the consistency or range of individual responses to program segments. Peatman and Hallonquist (14) made a correlational analysis of each program part with the other parts of the program. Twyford (20) measured learning from an educational film using pretests and posttests and produced a learning profile by distributing learning to the appropriate intervals on the time axis. Program improvement has been primarily based upon a comparison of the intensity or profile amplitude for a particular segment with respect to the average amplitude.

Profiles will show the relative amplitude of a particular section but other techniques are required to discover why the amplitude varies as it does. Hallonquist and Peatman (7) have employed the questionnaire and group discussion methods as well as statistics

for comparing content differences for segments having different profile amplitude.

The program selected for analysis may be a play as studied by Hayes (9) and Paul (12), a radio program studied extensively by Hallonquist (6), an entertainment film analyzed by Gallup (4), and Cirlin (3), or an educational film that has been studied intensively by Twyford (20). The analysis may be applied to less structured temporal presentations such as a classroom lecture or group discussion.

VALIDATION OF PROFILE TECHNIQUES

Profiles may be validated by making a comparison with accepted intensity measurements for profile segments, or profiles may be validated through usage in program improvement. Useful profiles are often intensity records of highly subjective attributes such as likes, interests, and learning. For this reason true values of the profile amplitude are not directly obtainable by any method. Twyford (20) validated nine methods of making rating profiles against a criterion profile that was prepared by exhaustively testing the content of an instructional film with two forms of a test and measuring learning by means of pretests and posttests. Measured learning was distributed on the time axis of the profile to those intervals that contributed to the learning. The correlation between a profile of learning by ratings and the criterion test profile was .64 when several corrections of the profile values were made. This work confirmed the findings of Sturmthal and Curtis (19) that ratings may *lag* several seconds after the content is presented and that ratings from one section of a film may *carry-over* into the following sections. Twyford showed that the correlation between subjective ratings of learning ("I am learning") and test measurements of learning is sufficiently high to indicate that ratings of learning should be valuable in comparing the effectiveness of sections of educational programs. Suggested uses included: (a) audible profiles of classroom lectures as an aid to preparing motion picture scenarios, (b) profiles for preproduction testing of films and (c) profiles for checking effectiveness in utilization of films.

The validity of the profile technique has been demonstrated through progressive changes of content for four broadcasts of *Behind the Scenes at CBS*. Hallonquist and Peatman (7) have shown that the average attitude score toward the programs can be raised from 19 to 40. Poorly liked parts of the program were

replaced on subsequent programs by dramatic and educational items which were then rated consistently higher than tidbits and promotional items. Analysis of the show *Youth on Parade* showed the differences in the *likes* and *dislikes* of adults and adolescents. Differences were found for specific songs, comedy dialogue, and parts slanted to the preferences of specific groups, while the dramatic sequences were found to be inappropriate to the lighter mood of the broadcast. A study of a quiz program showed intense dislike for the forced comedy of the quizmaster which contrasted with *likes* for the remainder of the program.

Nearly 5000 listeners to 202 individual commercial announcements have had their ratings recorded by CBS. The results indicated that announcements which were well integrated with the program content had higher ratings than poorly integrated announcements.

Teaching by radio has been investigated recently by Hallonquist (6) using the Program Analyzer. Personal involvement was found to be the key to maintaining interest in educational programs. A program entitled *Speaking of Words* was made more acceptable than formerly by featuring a quiz-master and a panel of authorities. Parts of the program dealing with words for *groups*, pronunciation of *i's* and the origin of the word *subjugate* rated low while parts dealing with slang expressions and pet peeves ranked comparatively high. Words that were used infrequently were of little interest to the audience. Hallonquist concluded that educational material is appreciated most when it is related to the personal, everyday problems, and interests of the listeners.

Hallonquist found contemporary human interest scenes more effective than historical scenes through analysis of the educational program *The Story of Measurement*. When there was a tie-in with current problems, listener's reactions to historical sequences became more favorable. The historical scenes were low spots of the program and resulted in a gradual decline of audience interest. In another comparison of the historical approach versus the dramatic personal type of development, it was found that children confused the historical characters through lack of identification, and learning was greatly reduced. In the program series *World Neighbors* the Columbia Broadcasting System used their findings of the importance of personal involvement by having the listeners see each foreign country through the eyes of its inhabitants. Each program had

a definite plot and a central character whose desirable characteristics were emphasized to facilitate identification. Native customs and music were incidental, facts and figures were eliminated, and emphasis was placed on such virtues as democracy, tolerance, and understanding.

Using the Program Analyzer of Lazarsfeld and Stanton, Sturmthal and Curtis (19) studied two films, *Valley Town* and *What So Proudly We Hail. Likes* and *dislikes* were recorded for groups of 190 and 160 persons respectively, and the ratings were related to the specific film content. Using a three-second interval as the smallest unit of analysis and a sequence averaging a minute and one-half, the contributions of the parts of the film were analyzed and compared with each other. *Like* reactions occurred where there was action, a process shown, excellent photography, contrasting scenes, and expected action. Scenes of a *deprivational* character elicited a *dislike* reaction. *Indifference* was indicated for incidental scenes such as people getting into a car and driving from one place to another as well as long optical transitional devices. They summarized their studies by stating that one cannot say that the depressing parts of the film should be cut out of an educational film just because they are disliked. More highly educated people tended to like best the less personalized sequences, the mechanical processes and skills, the shots marked by symbolism, and the more unusual photographic effects, such as the montage. The less educated were interested in domestic scenes, portrayals of relations between people, and in general the more sentimental scenes.

Hovland, Lumsdaine, and Sheffield (10) report on the use of a polygraph recorder to register audience judgments of *likes* and *dislikes*. The films were five issues of a series called *The War*. Twenty men judged the film at one time. The recorded scores were plotted as two profiles. Dislike for specific film content did not necessarily indicate that it should be removed from the film. Men who were tested with the Program Analyzer also filled out questionnaires and were interviewed. *Dislike* was registered for close-ups of persons speaking while actions were generally *liked*.

Hayes (9) and Paul (12) have improved plays by making repeated alterations in content until interest, as determined by an interest scale, was maintained at a high level.

Gallup (4) reports the use of profile methodology in the improvement of *The Jolson Story*. Cirlin and Peterman (3) indicated

that the use of the Reactograph for making profiles permitted entertainment film producers to discover the exact location of poor sequences in entertainment films.

KINDS OF RATING SCALES

The rating scale is determined by the kind of improvement desired. Radio programs have been rated for like-indifferent-dislike by Hallonquist (6) and others. Entertainment films have been analyzed in a similar manner by Gallup (4). Hayes (9) and Paul (12) analyzed plays on a rating scale of degrees of interest. Twyford (20) compared six different rating scales for measuring learning from instructional films. The six rating scales were: (a) "I am learning" or subjective learning, (b) like-dislike, (c) prediction of learning by classmates, (d) clarity, (e) goodness, and (f) terminal knowledge. In all, 22 different profiles obtained from tests and ratings were compared to determine their ability to indicate learning and terminal knowledge.

The title of a rating scale for evaluating radio programs was found to be relatively unimportant by Hallonquist and Suchman (8) who compared profiles of production methods and content. Little differences were found between ratings of *like-dislike, interest-uninterest, agreement-disagreement,* or *approval-disapproval.* This indicated that the audience would like to *hear more* or *turn off the radio.* Twyford (20) found that ratings of like-dislike correlated negatively with learning while the best rating scale for making learning profiles was the subjective rating profile in which the audience reported *I am learning* on a five-point rating scale.

PROFILE RELIABILITY

The reliability of a profile should depend upon the number of subjects, the reliability of the equipment, motivation of the audience to make accurate responses and the particular method selected to make the profile. Twyford (20) found that ratings of like-dislike for an educational film were difficult to make and that the range of responses was more restricted than ratings of subjective learning. The stability of rating profile intensity values averaged .93 for product-moment correlations between profiles for halves of an audience of 40 persons corrected for decreased sampling.

Hallonquist and Suchman (8) found a rank order correlation for parts of a variety program arranged in order of *likes* to be .91 when each group consisted of 40 persons. The correlation for a

dramatic program using 35 subjects in each group was .74. Peatman and Hallonquist (14) found the reliability of a program as an attitude test to be .99 by correlating the odd numbered program units against the even numbered program units and .99 by estimating the reliability from the mean intercorrelation of the program parts and predicting the reliability for a program 48 times as long. Twyford (20) has questioned these methods of measuring reliability by pointing out that the correlation would approach unity as the number of program units became increasingly large.

Schwerin (16) studied the reliability of the Program Analyzer using two groups of 19 people equated as to age and sex. Twenty-four divisions of a news program compared for ratings of strong interest gave a Pearsonian correlation of .89. The same sequences correlated .93 on no-interest scores. When samples of approximately 10 persons were used the correlation dropped to .89 and .85. When news items were isolated from the other program content the reliability dropped to .63.

PROFILE EQUIPMENT

Some of the more recent audience response recorders and analyzers are described in Table I. The number of response stations that can be used with a particular equipment is usually more restricted in complex equipments than in simple systems. The type of scale employed is usually not restricted by the characteristics of the equipment but by the needs for the equipment.

The equipment required to produce a profile depends upon the values plotted for profile amplitude, how the profile is interpreted, the number of responses required and the required ease in making the response. Two methods do not require profile equipment. Profiles may be obtained by having the audience mark ratings on an IBM sheet according to numbered program segment. Schwerin (17) has studied several respondents at one time by the use of score sheets. A *maximum learning profile* which shows the amount of learning that would occur if each person learned each fact during the presentation can be prepared directly from a scenario alone without testing or special equipment (20).

In the usual equipment each person in the audience has a push button or knob to actuate in order to indicate his response to a question or his reaction to a part of the program. This is usually electrically connected to the instructor's desk to turn on lights, to make a recording, or to indicate on a meter how many responses

TABLE I—AUDIENCE RESPONSE RECORDERS AND ANALYZERS
(In approximate order of increasing cost and complexity)

Name	Designed or used by	Type of Station	No. of Stations	Type of Record	Type of Scale
1. Learning Profile Equipment	L. Twyford	Variable resistor	40	Summated	Amount of learning
2. Think Ohmeter	Harwald Corp.	Push buttons	50	Combined	Opinion Yes-No
3. Reactograph	Schwerin Corp.	3 position toggle switch	800	Combined	Like-Neutral-Dislike
4. Program Analyzer	Hallonquist-Lazarsfeld-Stanton	Red and green push buttons	"Big Annie" 100	Summated	Like-Indifferent Dislike
5. Reactograph	WHO, Des Moines	6 position tapped resistor dial	Up to 100	Combined	Excellent, Good, Fair, Poor, Bad, Lousy
6. Hopkins Televote Machine	George Gallup A. R. I.	Dial with 5 point setting	—————	Combined	5 steps from Like Very Much to Like Very Little
7. Program Analyzer	Lazarsfeld-Stanton	Red and green push buttons	"Little Annie" 20	Individual	Like-Indifferent Dislike
8. Reactograph	Cirlin	Red and green push buttons	20	Individual	Like-Indifferent Dislike
9. Audience Response Analyzer	N. C. Meier	Linear slider	About 10	Individual	Degrees of interest
10. Recording Opinion Meter	General Electric	Potentiometer dial with off switch	Up to 132	Summated (percents)	Very Dull, Dull, Normal, Good, Very Good
11. Indicating Opinion Meter	General Electric	Same as above	Up to 132	Summated (shows percents on dial)	Yes-Degrees of Opinion-No
12. Response Analyzer	RMS Associates, Inc.	4 position selector switch	50	Combined percentage on meter	—————
13. Television Analyzer	Fordham University	Telephone dial	40	—————	—————
14. Group Analyzer	Naval Electronics Laboratory	Push buttons	20	Individual	Five choices
15. Film Analyzer	Instructional Film Research Program Penn. State	5 piano keys in plastic housing	40	Individual	Can be varied

are being made or to what degree an opinion is held. On the basis of this information the instructor or research worker records a grade or notes audience reaction. A great advantage over other methods is the speed of analyzing and recording or reporting a testing or evaluation session. Equipment can often be used for testing purposes as well as for program analysis.

Advantages of various types of equipment are evident from a study of those available. Conclusions as to their value drawn from one type of equipment may not apply to others.

Research or Applied Use. Most audience response recorders and analyzers have been designed for a specific purpose. They are often very complex and expensive and require considerable maintenance. This is not a great objection where the equipment is used only for research purposes. Other equipment has been designed for general use. This equipment is usually simpler, performs fewer functions, and costs less.

Individual or Summated Responses. Responses by individuals in the audience may be individually recorded or the responses may be added electrically and only the total given. More complex equipments may do both. The individual record is valuable for testing purposes. Multiple-choice, true-false and matching items can be given by the instructor and the correct answer revealed as soon as the response is recorded. Stein (18) has shown that this results in increased learning. These individual responses must be added and transcribed for grading purposes. When recorded individually the total score is not known immediately for each question or for each individual. The summated response is anonymous and the total response is immediately available. It cannot be used for individual testing but is convenient for general evaluation purposes. Equipment that gives a summated response is usually less expensive than equipment that gives individual responses.

Provision for Recording. Recording of responses may be accomplished by using (a) chemically treated paper that turns black when a current flows through it, (b) a pen recorder, (c) a recording milli-ammeter, (d) and electric typewriter or (e) a stylus trace on waxed paper. Recording may be done manually by watching lights or meter readings or may be recorded as a verbal record on a tape recorder. The provision for recording may be expensive. The translation of recorded information into total scores or relating it to program content may be very time consuming.

Type of Response Station. Electrical connections in the response station are made by switches which may be a push-button or multiple position switch. The part to be moved may be a piano key, knob, or button. Equipments that summate responses usually employ a variable resistance element. The amount of resistance included in the circuit is controlled by the respondent as he indicates the level of his response.

Type of Response. All-or-none responses can be made on equipment which has a switch and a connecting wire for each response. This type of equipment can be used for multiple choice testing. It can be used for voting or for registering a like for, indifference to, or a dislike for program content. Variable resistances are usually employed to rate, on a continuum, the opinion being held by the rater.

FACTORS IN THE SELECTION OF PROFILE EQUIPMENT

Audience response recorders and summators have been designed for various purposes. More than a dozen prototypes have been developed for experimental or research purposes but only three have been placed on the market. These are the Thinkometer, Genoral Electric Opinion Meter, and the RMS Response Analyzer. Several factors apply in the selection of profile equipment.

Cost. Few installations can be made if users must purchase expensive equipment. The high cost may prevent correct installation of the equipment which is required to facilitate its use.

Equipment Complexity. Most equipments need some adjustment, even though slight, that requires the instructor or operator to have special training or spend time reading a manual for operation of the equipment.

Equipment Repair. Much equipment is too complex to be repaired or checked by the instructor. This means that a repairman must be available and in most cases means that the equipment reliability is too low to be depended upon and is therefore not used. Equipment is not generally useful if it must be operated by an electrician.

Preparation. With the exception of special uses such as research, special investigations, and demonstrations most equipment requires considerable effort to use. When it is used for testing there is always a need to prepare tests, record grades, and be prepared to answer questions on the items.

Acceptance. There is a novelty effect surrounding the use of electrical equipment for testing. This probably results in increased interest and learning from a course of study. After the instructor tires of its novelty it is probably easier for him to revert to paper and pencil tests or rating scales. The equipment often becomes the target of displaced aggression of the student to excessive testing.

Group Reactions. Equipment becomes too complex if it must be designed to record individual responses and also add up the responses to give a group reaction. Group reaction systems are simpler but do not give individual responses. The anonymity of group responses is probably more acceptable to the student and reduces the need for extra preparation by the instructor. It involves all students at all times without the confusions normally found in group participations.

STEPS IN THE PREPARATION OF A LEARNING PROFILE

The method described below is based on research (20) that showed that a person actually is learning during the periods when he says he is learning. Figure 1 shows the dial and knob that are

LEARNING PROFILE EQUIPMENT DIAL

Figure 1

used. The procedure has been found to be very practical for rapid evaluations of learning. The steps that follow are those used to evaluate a speech.

1. It was decided to make a learning profile of a speech just a few minutes prior to the presentation.

2. Ten persons in the audience were given dials with knobs that could be turned to introduce up to 100 ohms resistance into a series circuit. An ohmmeter measured 1000 ohms when all 10 indicated that they were learning at a maximum rate.

3. Before the speech the following instructions were read:

> Under your right arm-rest you will find a rubber-covered wire. The dial on the end of this wire has a knob that can be turned to indicate how you are *rating* the program. Change your rating of the program as often as it is possible for you to do so. You are to rate the program on the basis of *your own learning*. When facts are presented by the program that you already know, you should report that you are not learning. Some facts in the program may be so difficult that you could not answer questions about them after the program if you were asked to do so. These facts were not learned. Learning means that some *change* has occurred to you that we could discover by comparing your knowledge before and after the program is presented. You are to point the knob to the *None* end of the dial when you are not learning, such as the very beginning. Turn the knob to *Most* when you are learning at a maximum rate. The positions in between represent intermediate degrees of learning. Will you now indicate that you are learning at a maximum rate. Now, at an intermediate rate. Now that you are not learning.

4. The lecturer was introduced and he began to speak.

5. A person acting as recorder plotted the ohmmeter readings against the time axis on a chart. He made notations of program content to aid in interpretation of the profile. With ten persons making the ratings the resistance reading can be easily converted to percentage of the maximum possible rating by moving the decimal point one place to the left.

6. At the conclusion of the speech the learning profile evaluation had been completed. The profile peaks and valleys were then interpreted to the audience. Individuals were encouraged to suggest new interpretations.

INTERPRETATION OF LEARNING PROFILES

The audience is usually interested to know that research has shown that learning occurs during the periods when they say it does. Figure 2 shows how the changes in learning as measured by tests vary with the ratings of learning. The product-moment correlation obtained was .64. It was believed that the profile obtained with tests was less accurate than the profile obtained by ratings because of the difficulty in formulating test items of proper scope and difficulty.

Comparison of a Test Profile and Rating Profile for the Film "Introduction to Measuring Instruments"

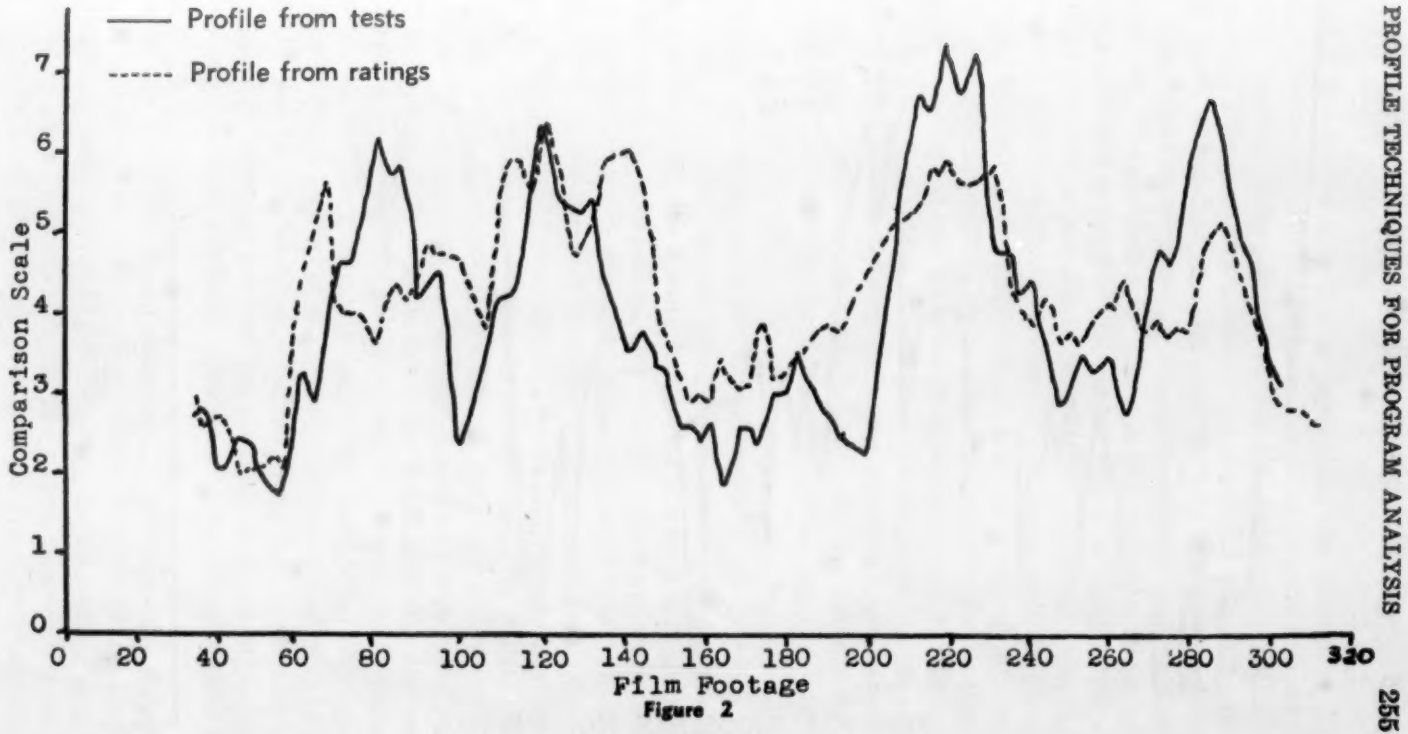

Figure 2

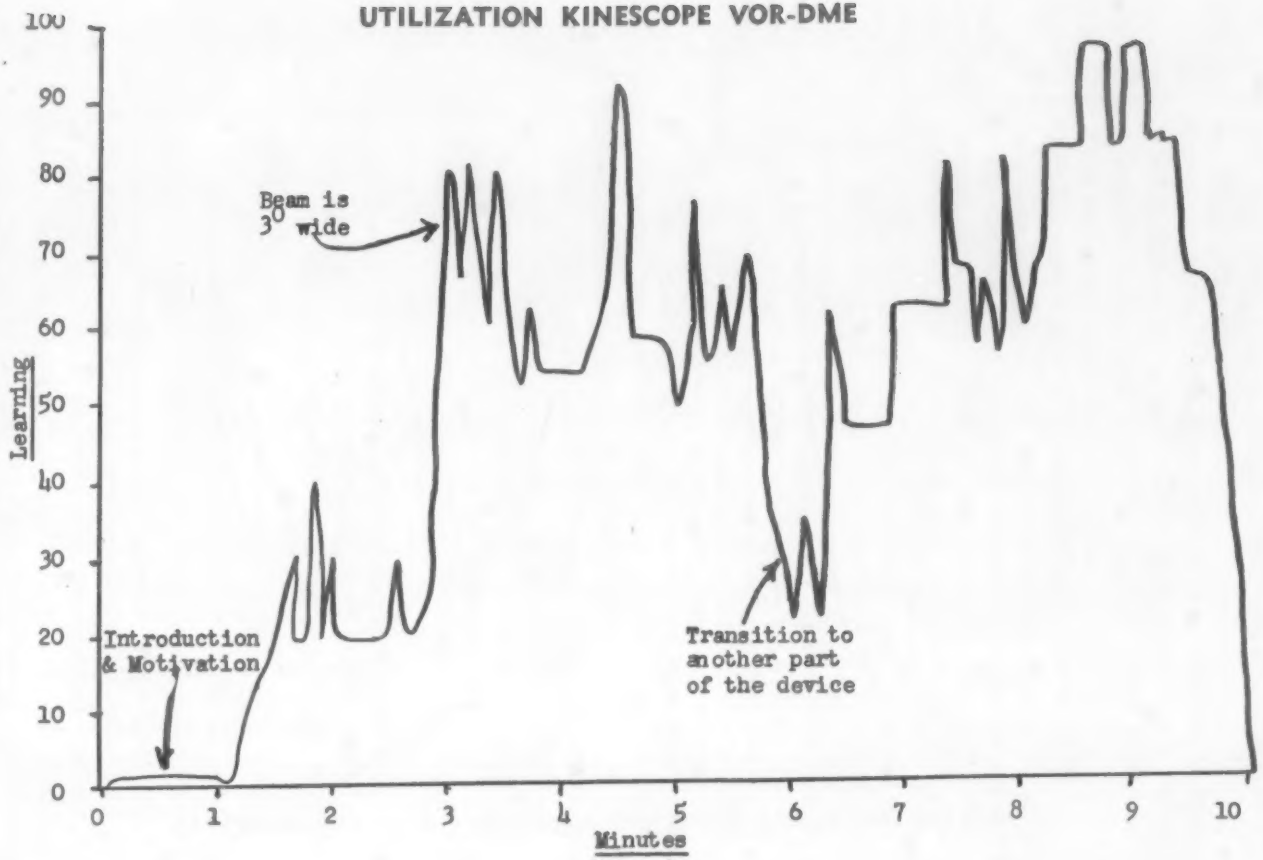
UTILIZATION KINESCOPE VOR-DME
Learning
100
90
80
70
60
50
40
30
20
10
0
Beam is 3° wide
Introduction & Motivation
Transition to another part of the device
0
1
2
3
4
5
6
7
8
9
10
Minutes

Figure 3

Figure 3 is a profile obtained by combining the ratings of 10 persons to a kinescope recording which described an aviation navigational aid. The first three minutes of this film produced practically no learning. This sequence stressed the need for planes to fly during all kinds of weather and the need for aircraft instruments that are reliable and easy to use. It was primarily an introduction designed to state the problem and motivate the audience. Since no new information was presented the raters found it impossible to state that they learned or were changed by it. By contrast, when the equipment was described by the statement *The beam width is three degrees wide* beginning at the third minute learning rapidly increased 60 percentage points. During the sixth minute the motivational theme was revived and learning dropped below the 30 percent level. There are some indications that the motivational sequences can be removed from the film without reducing learning from the remaining sequences; however, this has not been done systematically. Due to lack of time only the first 10 minutes of the film were analyzed.

Pretesting or evaluating a film or television program prior to production can be quickly accomplished using learning profile methodology. Profiles in Figure 4 were made of a *Nerve Gas* kinescope at three stages in its production. One profile was made while the script was read and simple drawings and actual objects were demonstrated. This profile showed that the spelling of names of objects was not learned and these sequences were eliminated. A second profile was made while the program was presented over closed circuit television with appropriate visuals. A different group of 10 persons rated the program and obtained essentially the same results. A third group of 10 persons rated the final kinescope film recording as it was projected. The similarity between these three profiles suggest that the method is useful for pretesting. Film research findings which show that the addition of the picture may add about 20 percent to the learning obtained from the commentary alone may explain why the profiles are so similar. In addition increases in visual learning probably coincide with increased auditory learning.

How closely must the rating audience approximate the target audience? Figure 5 shows how much profiles vary with group characteristics. The groups shown are secretaries, psychologists, naval reservists and naval recruits. Despite the range of interests and abilities there is a surprising concurrence in their ratings. The

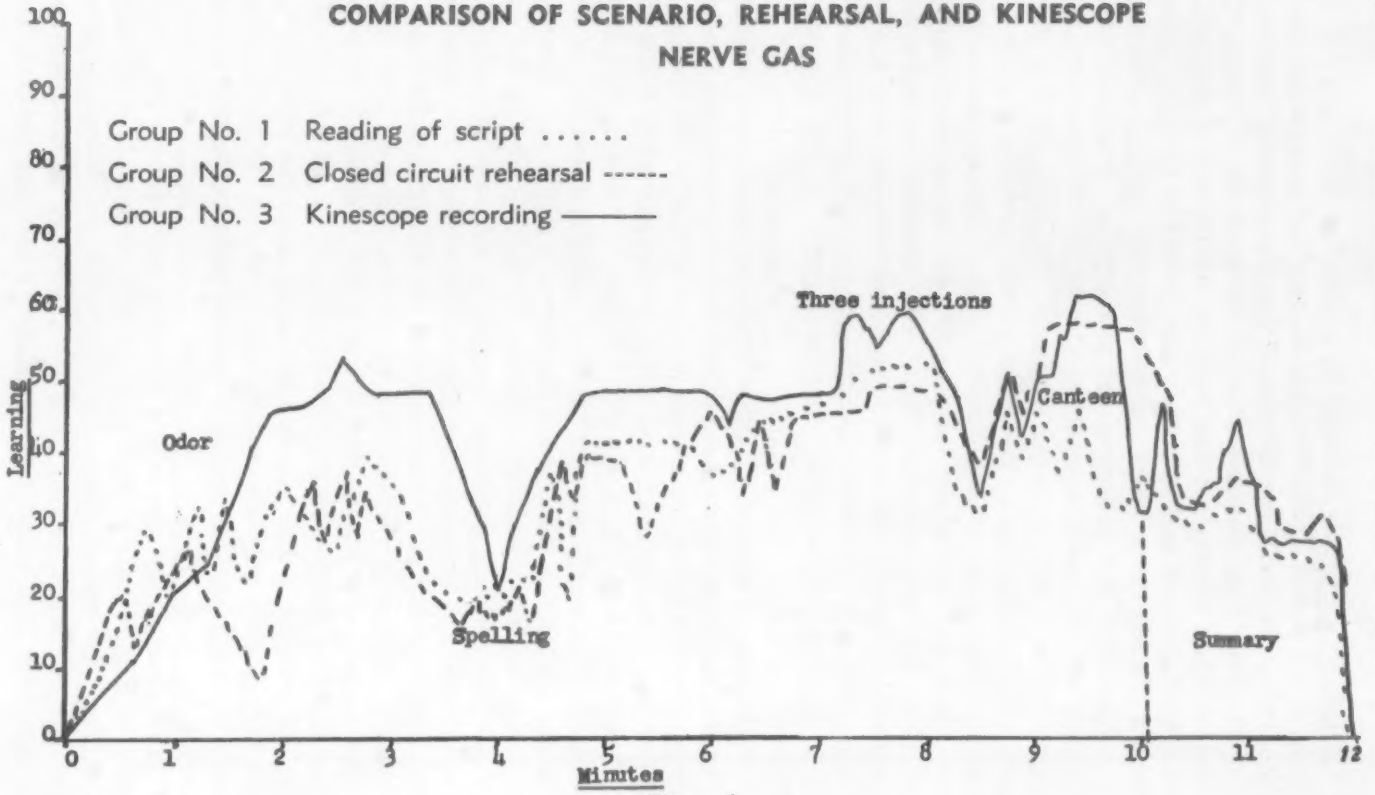
COMPARISON OF SCENARIO, REHEARSAL, AND KINESCOPE
NERVE GAS
Group No. 1 Reading of script .....
Group No. 2 Closed circuit rehearsal ------
Group No. 3 Kinescope recording ———
Learning
Minutes
Odor
Spelling
Three injections
Canteen
Summary
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12

Figure 4

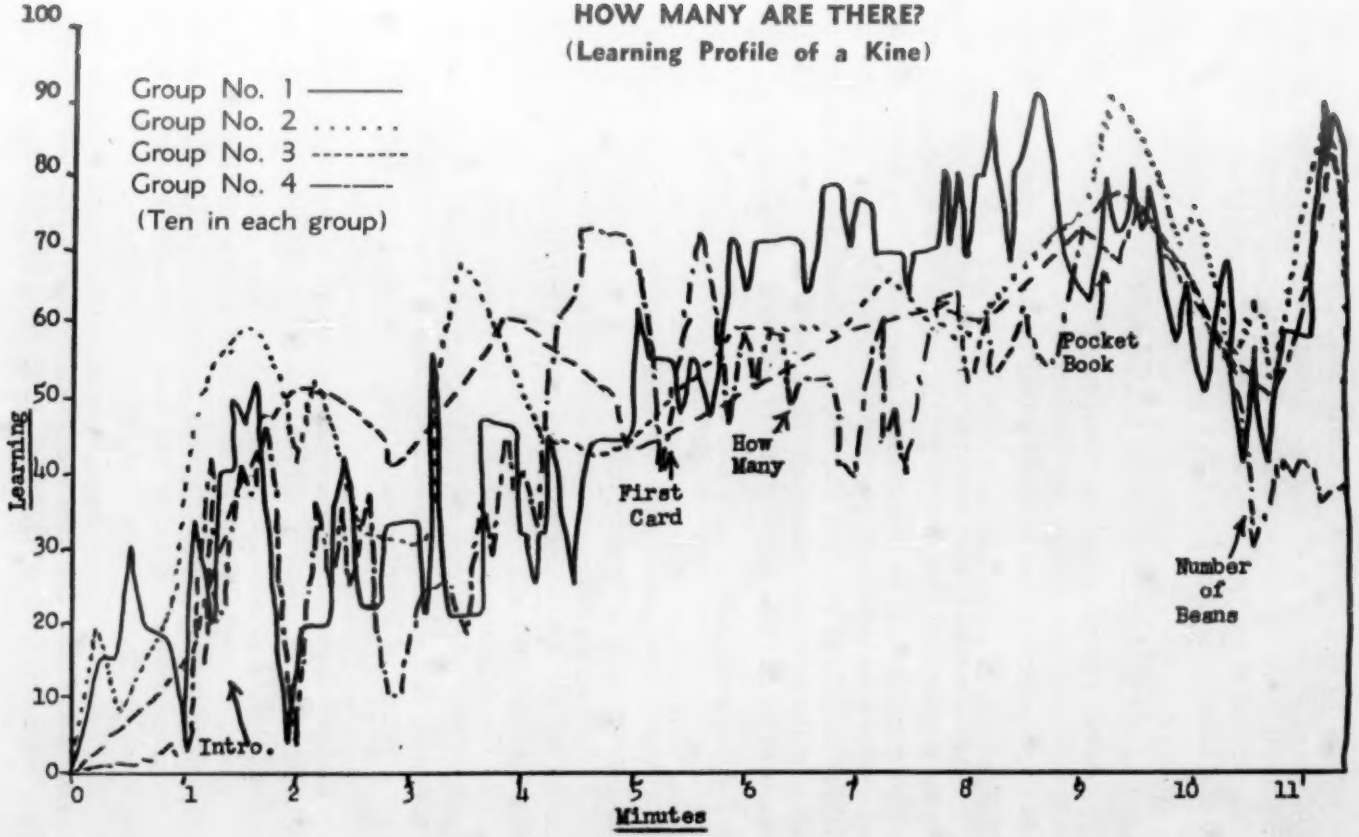
HOW MANY ARE THERE?
(Learning Profile of a Kine)
Group No. 1 ———
Group No. 2 .....
Group No. 3 ---------
Group No. 4 —·—·—
(Ten in each group)
Learning
100
90
80
70
60
50
40
30
20
10
0
Intro.
First Card
How Many
Pocket Book
Number of Beans
0
1
2
3
4
5
6
7
8
9
10
11
Minutes

Figure 5

variations in ratings can be attributed additionally to the small samples of 10 subjects. It is evident that the general trends of profiles merit more consideration than the small variations in learning. This conclusion has been reinforced by experience obtained in about 20 evaluations conducted so far.

LIMITATIONS OF THE PROFILE TECHNIQUES

Learning profiles indicate what content results in learning and what does not; but, it does not indicate why. It is usually not difficult to guess or discover by questioning the raters why they did not learn.

No single type of equipment or method for making profiles has yet been generally accepted. For this reason new equipments and methods continue to be planned and used while little knowledge or experience is accumulated. Further research may show the value of making ratings of retained learning as contrasted with learning as rated in the previous examples. Motor-skill learning may also be measured by the technique but there has been no validation of this.

SUMMARY

Several conclusions may be drawn from the investigations which resulted in program profiles.

1. Program profiles are practical and their effectiveness is indicated by the establishment of several organizations to conduct program analyses.

2. The selection of a rating scale is dependent upon the desired result. When entertainment is the criterion the like-dislike or interest scale should be employed. If a change in knowledge is the goal, then a rating of learning scale should be used in producing the profile.

3. Several researches have shown that reliable results may be obtained from 40 subjects and that general indications may be obtained from 10 subjects.

4. Some program profiles have been shown to be valid by a comparison with a criterion profile obtained by exhaustive testing of program content. Validity has been demonstrated through the use of the profile to progressively improve programs.

5. Program profiles have general utility as attested by researchers who have analyzed radio broadcasts, plays, entertainment films, educational films, television programs, and lectures.

6. More than 12 makes of audience response recording and summating equipment have been constructed and several of these are commercially available.

7. Investigators consistently point up the broad possibilities of summating audience ratings for program analysis.

8. Rating summators are an audio-visual aid and should be used to evaluate instruction and to facilitate interaction and participation in the classroom.

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ORAL COMMUNICATION: STUDIES IN LISTENING

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An area of research frequently neglected by the audio-visual specialist is that of listening. This article is designed to fill the gap and to present a systematic review of the major studies in the field. Robert S. Goyer is in the Department of Speech, The Ohio State University.

VIRTUALLY all oral communication presupposes at least four elements: the communicator (speaker), the communique (message), the communicatee (listener), and the occasion surrounding the entire process (environment). If we can assume that each of these elements has a particular value, proportional or otherwise, relative to the total effectiveness of a given act of communication, it follows that the more effective a given component is, the more effective will the entire process tend to be.

We might further conclude that the more we can discover about each of these elements, the better are our final chances for effectiveness. To this end, much useful information has been developed. Historically, however, the third of the four elements of oral communication mentioned above probably has been most neglected in terms of careful and systematic analysis of the nature of the process involved—a process generally known as *listening*.

What are the relationships between the listening process and these four elements of oral communication—including the listener himself? Is listening a skill to be taught and learned, as such skills as speaking, reading, and writing are taught and learned? If critical listening can be learned, what methods and practices are best suited to its accomplishment, and what are the relationships between the methods used to learn effective listening and those used to learn other communication skills? Is listening strictly a "consumer" activity, such as reading generally is considered to be, or

can it be as active and creative a thing as speaking? These questions are but a few of many which might be raised concerning the general concept of listening.

In an effort to systematize and review whatever printed material could be found relative to purposeful listening in oral communication, the writer, under the direction of Edgar Dale, considered some 200 articles, books, and unpublished theses, with a view to determining what *had* been done in the field, as well as to suggesting what *might* be done. Both of these phases of the research problem are considered in this article.

LISTENING DEFINED AND DESCRIBED

What is "listening"? One of the early specific attempts at definition of the term was made by W. S. Tucker (41) in 1925, when it was defined as a process involving " . . . an analysis of the impressions resulting from concentration where an effort of will is required." Although notably nonspecific in terms of characteristics of the process, this definition nevertheless represented an effort at description.

Rankin (33) in 1929 defined listening ability simply as the ability to understand spoken language. Wiksell (44) points out that as of 1946 little recorded effort was found which attempted to define listening *per se*, although of late general agreement has been reached concerning its importance, the need for adequate ability in the skill, and recognition that it should occupy an important place in the educational program. More recently, Nichols (31) has described the term as "the attachment of meaning to aural symbols."

Caffrey (10) prefers the term "auding" to "listening," asserting that the former is probably a more accurate term. For him, "auding" is to "reading" what "listening" is to "looking" and "hearing" is to "seeing." Most writers, however, refer to listening as Caffrey refers to "auding," and virtually all agree with Caffrey that understanding and comprehension are integral characteristics of the process if it is to be effective. Weaver and Borchers (43) suggest that listening is an active, selective process; Sullivan (39) suggests that it is also purposeful, critical, and creative as well as selective. For Watts (42), effective listening involves responsiveness and retentiveness; for Murphy (29), purpose, accuracy, and responsiveness are the essential characteristics.

Seth A. Fessenden (19) postulates the following attributes of

good listening: (a) a readiness to listen, (b) an ability to discriminate among sounds and ideas, (c) the capacity to give meanings to the selected sounds, (d) the ability to relate the meanings given to certain sounds to other experiences, (e) the ability to evaluate properly the medium and manner of the sound presentations, (f) the willingness to disregard prejudice.

Wiksell (44) analyzed effective listening in all of its aspects into these factors: (a) an adequate hearing acuity, (b) a recognition on the part of the listener of the problems and obstacles to be overcome in order to listen effectively, including such things as improper attitude, boredom, fatigue, and the like, (c) a knowledge of the specific kind of listening situation and the listener's adaptation to it, including such kinds as casual listening, intent listening for exact information, and other types of listening, (d) the relationship between listening and vocabulary, (e) the judging of what is heard —being able to think and to analyze while listening.

Nichols (30) relates the last of Wiksell's points—listening comprehension—to fairly definite factors. His study suggests that factors which seem *clearly* to influence comprehension include intelligence, reading comprehension, vocabulary, ability to make inferences, interest and curiosity, physical fatigue, and audibility of the speaker.

Some factors which apparently *do not* significantly influence listening comprehension include hearing acuity, note-taking ability, distance of the listener from the speaker, and previous training of the listener in the subject discussed. It might be noted that Nichols' view on hearing acuity is apparently at odds with that held by Wiksell.

Some factors which Nichols feels *may* influence listening comprehension include susceptibility to distraction, sex of the listener, physical facilities, speaker effectiveness, and previous speech training. He also notes that poor listeners generally tend to overrate their own conscientiousness in listening in a given situation, as well as the responsibility of the speaker for the listener's comprehension of the subject matter.

MEASURES OF LISTENING

In order to develop some sort of quantitative measure of listening comprehension, Ewing (18) in 1946 developed a "speaking-listening index," in which the speaker's and listener's conceptions

of theme and main ideas in a speech are physically compared by means of a number score derived through the use of Ewing's formula. Chall and Dial (12), in an effort to predict listener understanding and interest in newscasts, suggest that both the Dale-Chall and Flesch readability formulas will roughly predict three levels of listening difficulty, as validated by the subjects' judgments of understanding and their ability to answer objective questions covering recorded material used in the experiments. Their data suggest a definite relationship between comprehension and interest, as indicated by high correlations between subjects' judgments of understanding and interest (.93) and between interest and the number of objective test questions correct (.82).

Blewitt (7) has developed a listening test which has shown a correlation of .39 with the ACE C2 (Reading Comprehension) test, and a correlation of .73 with the Linguistic Test in the Psychological Examination. He therefore concludes that his test measures a skill dissimilar to reading, but highly related to the latter test. Caffrey (11), however, suggests that since reading and "auding" are both language skills, what is said of one applies to the other, once the difference between the nature of the symbols involved is conceded. His data supporting this contention have not been advanced as yet. Clyde Dow (15) has developed three listening comprehension tests limited to expository materials only with intercorrelation of reliability coefficients of .70, .77, and .71 respectively. Correlations of these three with the ACE reading test mentioned above are .53, .39, and .61 respectively.

Brown and Carlsen (9) refer to listening as an "assimilative" or "receptive" skill, and have developed two forms of a listening comprehension test to measure these specifics: immediate recall, following directions, recognizing transitions, recognizing word meanings, and lecture comprehension. Correlations between the test and mental ability tests ranged from .78 (California Test of Mental Maturity, Advanced, for 74 Grade XI pupils) and .29 (ACE Psychological Examination for 150 college freshmen). Correlations between this listening test and the Nelson-Denny Reading Test ranged from .63 for 102 members of an adult extension reading class, to .36 for 150 college freshmen.

Paul F. Rankin (33), one of the real pioneers in the measurement and development of listening comprehension, in 1929 presented some of the earliest descriptive statistics concerning meas-

urement. A study of 21 persons in 1926, and 47 more in 1929, revealed that about 45 percent of a person's time spent in communication is concerned with listening, 30 percent with talking, 16 percent with reading, and 9 percent with writing. Rankin points out that "although frequency of use should not be the *sole* determiner of what emphasis a particular ability should receive in the school curriculum, it is *a* determiner." He concludes that:

> Listening ability is *not* more closely related to intelligence than other school skills such as reading and arithmetic. Nor are reading and listening more closely associated than are reading and "English." Therefore training in reading alone cannot be relied upon to improve listening ability.

For Rankin, procedure for training listening skill requires that the pupils' purposes in listening be aroused, that their physical and mental abilities be determined, and that directed practice in listening be furnished.

TRAINING OF LISTENERS

Frederick and Winkler (20) in 1934 suggested that conscientious application of two guide rules would result in efficient listening: (a) be mentally active and prepared for what you hear, and (b) continue thinking about the subject discussed after listening ceases.

Baird and Knower (4) suggest that the three general purposes of listening include: (a) listening for information or inspiration, (b) listening for enjoyment, and (c) listening to improve the understanding and use of principles of communication. Furthermore, each of these purposes is subject to degrees of intensity of listening, suggesting the importance of *attention* on the part of a listener in a given situation.

Leo Rockwell (34) suggests that testing and developing ability in listening requires an assurance that the student is physically capable of hearing, a knowledge of his listening vocabulary, a purpose on the part of the student for listening, and an ability by the student to grasp the central thought in a long utterance. Harlen M. Adams (1), a prolific writer in the field, offers a specific program for the improvement of listening. The procedures to be followed include: (a) careful selection of materials, (b) planning or preparing for the actual presentation, including the physical arrangement of the room, and such things, (c) presentation of the material, and (d) evaluation of material presented.

Dias (14) would combine listening activities with written composition activities in the schools, by requiring students first to listen to oral readings, then to state the gist of the writer's thought; or to listen first to a radio or local discussion and then to write the arguments of each side. Nichols (31) suggests "three perfectly safe" types of activity around which to build a listening course: (a) improve physical and physiological conditions, (b) teach note-taking and outlining, (c) train students in the use of good study techniques. Later, he suggests several specific factors of good listening (32). Hook (24) suggests such techniques as group discussion on listening, practice in following instructions, analysis of organization of material, and tying-in by the teacher of what is heard with what is known.

Heilman (23) concludes that the listening ability of college students can be significantly improved with training and practice. He further suggests that: (a) improvement in listening habits resulting from special training transfers to situations not connected with the training, (b) training in listening is especially profitable for low aptitude students, as indicated by scores on the American Council Psychological Test, (c) no conclusive evidence was discovered relating the listening and reading abilities, nor relating listening ability with intelligence.

In the particular area of radio listening, Solheim (37) maintains that the school has taken the first step in developing good listening habits if pupils can be led to appreciate their democratic privilege of listening to all sides; if they can be made to feel their responsibility in listening; if they are given the opportunity to listen to radio programs *in school*, and to discuss them critically there. Tyler (41) finds that for radio " . . . poor listening habits are more often than not the result of a lack of extended and *varied* listening experiences."

How can elementary teachers improve the listening of children? Althea Beery (5) suggests the following ways: (a) by sensing the relationships of listening to other phases of communication, (b) by understanding the psychological process of listening, (c) by providing general conditions conducive to listening, (d) by utilizing opportunities for children to listen, (e) by understanding the developmental levels of listening—the goals toward which teachers and pupils should work, (f) by keeping alert to new inventions and equipment which will aid the program. Miss Beery feels that "the

substantial control over the mother tongue which a child brings with him to school should be widely used to facilitate his learning during those years in which he is acquiring control over the tool of reading." She finds indications that the use of the spoken word, including the give and take of spirited discussion, is a more effective way of learning than the use of the written word.

COMPARATIVE EFFECTIVENESS OF ORAL TECHNIQUES IN LEARNING

Conrad Freed (21) has suggested that most elementary and secondary schools subject their students to a "silent conditioning process," which he describes as "an atmosphere which tends to subdue pupils' desires to communicate freely." He continues:

> When the student enters school he is functioning on an oral basis, and no amount of experimental data at present exists to justify replacing that oral basis with a silent learning situation. "Silent conditioning" arises from a philosophy which holds that learning comes from books (reading); a philosophy that learning comes from *living* (of which reading is merely a part) would force these silent techniques into more subordinate positions.

Freed concludes that this silent approach tends to inhibit curiosity in children and that a more socialized classroom technique is desirable—especially since "the use of oral techniques does not decrease the accumulation of factual data."

Edmiston and Braddock (16) approach the problem from the point of view of teaching efficiency, suggesting that a significant index of the latter is "group control." Based on minute-by-minute, observed attention on the part of students, the four most effective methods seemed to be oral student reports, demonstrations, discussions led by students, and the workbook method. The authors of the report conclude that the best methods seem to involve a combination of visual and auditory techniques.

Knower, Phillips, and Koeppel (25) have reported a study which compares the effectiveness of (a) reading aloud, (b) speaking with and without notes, and (c) speaking with visual aids (cardboard drawings). They suggest that the comparative effectiveness of speaking and oral reading depends largely on the quality of performance, since greater recall was produced by silent reading than by poor speaking, and by good speaking over silent reading. The use of visual aids tended to increase immediate recall values, with no noticeable effect on delayed recall. The authors also point out

that auditory comprehension has a low positive correlation with college ability test scores and with silent reading comprehension (.27 in each case).

A study by Loder (28) concerning the learning and retention of factual material presented by loud-speaker and by the speaker in person suggests that for immediate recall the *direct* presentation seems significantly superior, and for delayed recall the methods seem equally effective. Pupils, however, made the greatest learning gain from the direct method (4.4 percent greater than via loud-speaker), although that which was learned via loud-speaker was remembered in somewhat greater quantity.

Gauger (22) tends to support Loder's conclusions so far as high-school pupils of Grades XI and XII are concerned. Some of his subjects heard a given talk over the loud-speaker, some heard and saw a speaker give the talk without gestures. Gauger decided that: (a) listening comprehension is better when the speaker is present, (b) the use of gesture has a better effect on the listening comprehension of high-school pupils of Grades XI and XII than the lack of use of gesture, and (c) there is a positive relationship between listening comprehension and interest in the talk.

Kramar and Lewis (26) also support the thesis that a speaker who is visibly present is more effective than one who is not.

Differences between reading and hearing vocabulary have been pointed up in a study by Anderson and Fairbanks (3), who tested the ability of 220 university freshmen to recognize words heard and read. They determined these things:

1. Vocabulary ability is a centrally determined function, operating on the average, independent of the mode of presentation of material (reading or listening).

2. The relationship between *reading* vocabulary and reading ability is significantly more acute than between *hearing* vocabulary and reading ability. Reading vocabulary is also more closely related to intelligence than is hearing vocabulary, although the difference is not absolutely reliable statistically.

3. Poor readers scored 8 percent higher in the hearing than in the reading vocabulary test, whereas readers of medium ability and high ability scored 5 percent and 10 percent higher, respectively, on the reading vocabulary test.

One attribute of poor reading is inability to recognize words visually although the reader may understand these words in hearing them. Since poor readers, in general, either avoid reading situations or have not had extended opportunities to read, it is possible for them to have learned more words in hearing than in reading experiences.

As early as 1917, Erickson and King (17) were concerned with "A Comparison of Visual and Oral Presentation of Lessons in the Case of Pupils from the Third to the Ninth Grades." Their study involved four groups of pupils, with each group divided into two sections. One section read the assignment which was presented orally to the other section. Immediate recall tests suggested that a distinct advantage exists in favor of the oral method, based on the median score of correct answers for each class group. According to the authors: "Exceptions to this tendency probably result from the nature of the material presented, and differences in the skill of presentation."

Young (46), in 1936, performed a similar experiment with the same results. Worcester (45) in 1925 tried a similar experiment, except that adult subjects were required to memorize the material. His chief conclusion: " . . . the auditory method of presentation is intrinsically superior for retention to the visual method . . . ." In addition, he points out that neither method is superior as regards rate of learning, and that the person who learns and retains well by one method tends to do likewise by the other. Furthermore, age does not greatly affect ease of learning, but it does slightly affect retention. Stanton (38) supports this general thesis, suggesting that for fictitious advertising copy the auditory method of presentation was superior to the visual method for both immediate and delayed recall. A similar study by DeWick (13) supports Stanton's conclusions.

Beighley (6) investigated the influence upon listener comprehension of four variables—mode of presentation, vocal skill of readers, difficulty of material, and organization of material. His results suggested that, for the material used, comprehension gained through silent reading "was consistently greater than that gained through hearing." However, vocally skilled readers were able to bring about more listener comprehension than were the vocally unskilled readers, under some circumstances. Although easy material (in terms of the Dale-Chall readability formula) was better comprehended than difficult material, Beighley found no "notable values in organization as contrasted with the kind of disorganization used" in affecting comprehension.

M. E. Carver, writing in *The Psychology of Radio* by Allport and Cantril (2), contends that the relative effectiveness of the listening process as compared with reading is suggested in these four areas:

1. Difficulty of the material. "The effectiveness of auditory presentation tends to vary inversely with the difficulty of the material presented."

2. Type of material. "The effectiveness of auditory presentation is limited to meaningful material, and tends to be superior for subject matter that is concrete and serial in nature."

3. Mental functions. "If other conditions are kept constant, the mental functions of recognition, verbatim recall, and suggestibility seem more effectively aroused in listening; whereas critical attitudes and discriminative comprehension are favored by reading."

4. Educational background. "The higher the cultural level of the listener the greater is his ability to profit from auditory presentation."

A study by Larsen and Feder (27) tends to support Carver's suggestions, especially as regards the difficulty of the material used. In this experiment, however, it might be significant to note that two forms of the Nelson-Denny reading test were used—one form being read *by* the subjects, the other read *to* them.

Rulon (36) supervised a series of experiments which suggested to him that recordings showed no superiority over printed matter in teaching pupils informational material or in motivating them to read supplementary material. He further concluded that a teaching method employing printed matter was superior to one employing recordings for immediate recall, although after a week's time no differences were apparent (35). A study by Brown (8) in 1948 suggests a "slight but definite" relationship between reading and listening ability. The results also suggest that with students of certain ability levels and materials of certain difficulty levels, reading is slightly more efficient than listening in terms of immediate recall. Like Larsen and Feder, however, Brown used two different forms of a *reading* test (Part V of the Purdue Placement Test in English) in his experiments.

SUMMARY AND CONCLUSIONS

It should be recognized that the writer was necessarily selective in presenting the preceding annotations and comments, but an effort was made to cover all phases of the listening area in as representative a manner as possible. If it were necessary to summarize the material here presented, it would be noted that the problem of listening has long been *accepted*, but not particularly *noted*.

The literature reflects little concern with the problem before Rankin's work in the late 1920's; since that time a great deal of conjecture and opinion has found its way into print, but little of a truly controlled experimental nature, until the advent of World

War II. Since that time some serious, though limited, effort has been expended to determine the characteristics of the listening process, its relationship to reading and intelligence, its effectiveness as a learning device, and tests and measurements of listening skill.

All of the work reported in these areas is by no means consistent; some appears to be quite contradictory. For example, no clear pattern has yet emerged concerning the relationship between listening and reading as separate skills, or between the two as learning devices. With few exceptions, most authors writing on the latter problem have not been concerned with the possible ramifications suggested by the degree of efficiency with which oral communication is presented in comparing relative comprehension of material by listening and by reading—an example of one of the possible relationships existing between communicator and communicatee mentioned at the beginning of this article. Most writers have been concerned simply with the degree of difficulty of the material itself.

In regard to listening tests, at least three points suggest themselves. First, the omnipresent question of validity: If listening ability really exists, are these tests actually measuring that ability or something else, such as intelligence, linguistic skill, reading ability, individual maturity? Second, can it justly be assumed that a *reading* test administered orally serves as a valid measure of *listening* skill, as some experimenters have assumed? Third, can the use of *readability* formulas be wholly justified for measuring the difficulty of *oral* material, as some experimenters have done, if a difference in basic nature (sentence structure, vocabulary, and the like) is recognized between spoken and written English? All three of these questions suggest that considerable difficulty has been experienced in isolating listening ability from other personal characteristics—if, indeed, it can be isolated.

It is possible, of course, that the seemingly opposed conclusions many experimenters have drawn might be explained in terms of semantic difficulties—a differential use of words to describe essentially the same conditions. Nevertheless, particular areas do suggest themselves which should be exposed to further controlled analysis. Topics to be considered might include:

1. A more definitive analysis of listening ability as such
2. The nature and causes of individual differences in listening ability

3. The relationships between listening ability and the various personality and social traits and skills of individuals

4. The relative effectiveness of listening as a learning device

5. The relationships between the listening process and the four elements of oral communication mentioned above

6. The testing and measuring of listening ability

7. The teaching of listening skill, including the particular techniques and processes required.

It is generally acknowledged that listening serves a variety of purposes—we engage in *selective* listening according to our particular desire at the time. Perhaps more emphasis should be placed on *adaptive* listening in order to increase the effectiveness of the process as a skill. In view of the wide use of listening in learning, it seems not only desirable but necessary that we know more about this process.

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USING A FILM TO TEACH A HOME NURSING PROCEDURE

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This study by the American Red Cross demonstrates the value of using a film to teach a procedure, but points up the weakness of the film alone without guided practice. C. H. Whelden, Jr. is Chief Statistician for the American National Red Cross.

GUIDED practice has always been a basic part of the instruction in simple home nursing procedures given to lay persons by the American Red Cross. Several problems, however, have made application of this teaching method difficult in secondary schools. Among the problems have been large classes, limited time for class sessions, and lack of adequate equipment. This study was undertaken to discover whether the use of teaching films might prove a satisfactory method of overcoming the problems. Accordingly, a black-and-white, 17-minute, sound film dealing with the care and use of the clinical thermometer was prepared for the American Red Cross by the Becton, Dickinson Foundation.[1] The express purpose of showing the film to the groups selected was to learn whether: (a) The film could successfully present information usually given and explained by an instructor. (b) The omission of guided practice would reduce learning to an unsatisfactory level. (c) A good retention of learning could be expected over a period of time following the film presentation, with or without accompanying guided practice.

THE TESTS

Two tests were made, the first in early 1952, the second late the same year.

[1] *The Care and Use of The Clinical Thermometer*, The American National Red Cross.

The first test proved inconclusive, largely because controls were not adequate and too many variables could be adduced to vitiate the test results. Nonetheless, the general indications of the first test were subsequently given direct or indirect corroboration by the second test.

The second test sought to learn whether there is substantial acquisition of correct knowledge and skill despite the omission of guided practice following the film showing. Degree of retention of correct knowledge was tested by a deferred rating made seven weeks later; no refresher or other instruction on the subject was given in the meantime.

Experienced Red Cross home nursing instructors conducted the test, which was made with 187 girls and 312 boys during regular class periods in a District of Columbia high school. All participants were alerted before seeing the film to watch for key points. Following the film showing, part of the students were given the usual guided practice. The remainder received only a brief oral review, without demonstration, of the key points called to their attention before the showing. At the next regular class session (the same week) all students, working in groups of six around a table, were tested and rated. Rating, in terms of "yes" (correct) and "no" (incorrect), was made on 12 items of performance relating to handling, shaking down, reading, and cleansing a clinical thermometer. Each rating sheet carried previously made entries showing the student's sex, year in school, academic average in required courses, and answer given to question of whether he had ever previously taken temperature with a clinical thermometer. The sheet also showed which test group the student was in.

THE FINDINGS

It was found that degree of correct performance was not related to year in school or to average academic grade. However, performance was markedly superior among the 86 students who indicated in the pre-test questions that they had had previous thermometer experience.

With the isolation of the 86 and an additional 45 for whom information about previous thermometer experience was not given, there remained for further study the 368 students without previous thermometer experience. These students were presumed to be most representative of the average home nursing group. Of the 368, 175 (73 girls and 102 boys) had guided practice while 193 (76 girls and 117 boys) had not.

When there was guided practice following the film, 87 percent of the total performance-item ratings were correct for the girls and 81 percent for the boys. Without the guided practice, 66 percent of the total performance-item ratings were correct for the girls and 62 percent for the boys. In other words, for both boys and girls the absence of guided practice was associated with a drop of about 20 percentage-points in the proportion of total item ratings that were correct. For both the boys and girls, however, there was still a substantial proportion (better than three-fifths) of total performance rated correct even without guided practice.

Deferred ratings were given to the group of 315 who had no previous thermometer experience, of which 157 (63 girls and 94 boys) had received guided practice and 158 (62 girls and 96 boys) had not. The paired original and deferred scores of each student were compared.

Although it was expected that the students would commonly do less well on the deferred than on the original rating, the anticipated result was not found. There was a high degree of variation, but more students did better on the deferred rating. The tendency toward improved scores was particularly pronounced among students who had *not* had guided practice.

The results of the deferred rating demanded that there be examination of possible reasons for the variations before attempting to assess the significance of the findings.

The first element suspected of contributing to the unexpected nature of the results was a possible variation of rating standards among the several raters. An analysis of the data, however, showed that variation in rating standards did not account for the large volume of improved scores on the deferred rating or for the relatively greater improvement among students who had not had guided practice.

There could have been no planned preparation for the deferred rating since the teachers had not known one was planned. Some students could have received additional professional guidance at home, but such a factor could hardly have accounted for the volume of improvement in deferred scores. School authorities reported, however, that the film presentation created great interest among the students. The best test of the effect of "new interest," it was felt, would be a comparison of original and deferred ratings among the 72 students claiming thermometer experience before the original test (72 of the 86 such students rated in the original test received deferred ratings). Theoretically, if the "new interest"

factor was a major one in producing better deferred ratings, this group should have shown little or no improvement over original ratings. It was found, however, that although the volume of improvement in this group was less than among the group without previous thermometer experience, it was nonetheless large enough to suggest that some other factor than "new interest" was responsible for the high frequency of improved scores on the deferred rating.

Another possibility was that students had observed and imitated other students, following those with a reputation for doing things correctly. Two performance items, however, did not lend themselves to imitation following observation—"locating the mercury" and (reading and) "recording temperature"; each student had to rely on himself for correct performance of these items. Examination of rated performance on these two items alone showed, as in the total scores, a considerably larger number of improved than of poorer deferred ratings. Observation and imitation, therefore, could not have been a decisive factor.

The remaining logical explanation was the assumption, confirmed by two of the raters, that in the process of rating the nurses trained as home nursing instructors would have a natural tendency to point out errors in performance and call attention to correct procedure. Students thereby received additional instruction (in effect, a kind of guided practice) while going through the original rating. This factor could well have accounted for the large measure of improved performance in the deferred rating, especially among those students who had not received guided practice following the film. Whatever the effect of this factor, it could nonetheless be concluded from the results of the deferred rating that there had been very good retention of knowledge following instruction by the film. No conclusion could be drawn, however, on the degree of retention that might have been present had there been no guided practice following the film.

CONCLUSION

1. The film is a good substitute for an instructor in presentation of subject matter on care and use of a clinical thermometer; it has the special advantage of reaching a large number of persons with a uniformly acceptable quality of demonstration and explanation in a single showing. The instructor should alert students to key points before the film is shown. Opportunity for questions and

a review of key points should also be provided following the showing.

2. Although there appears to be substantial acquisition of correct knowledge and skill without it, guided practice included as part of the instruction produces better results. Without guided practice, notable weakness appears in a few critical areas of performance.

3. The critical areas of performance that are notably weak without guided practice also show relative weakness with guided practice (even when an instructor demonstrates and explains before the guided practice). These areas are: locating the mercury, shaking down the mercury to a level that will assure correct registering, and reading and recording temperature. Less critical but similarly weak in performance is the use of a waste container while cleansing. Improvement of teaching technique in these areas is needed, particularly if guided practice is not part of the instruction. More emphasis might be placed on these elements in all instruction; flash cards and an enlarged thermometer model to supplement the film might also be useful. In any event, the instructor should be sensitive to the needs of individual students, remembering that these critical points of instruction may be more difficult to learn.

THE FELTBOARD IN THE TEACHING OF LOGIC

•GEORGE KIMBALL PLOCHMANN

Here one of the simplest of audio-visual devices—the feltboard—is put to work teaching one of the most abstract of subjects—logic. George Kimball Plochmann is associate professor of philosophy at Southern Illinois University.

IT WAS apparently a conviction of certain Greek thinkers that some of the problems of philosophy could best be taught by appeal to the eye, and certainly many of their successors have adopted the plan of diagraming important relations between concepts, or at least of rendering in prose the descriptions of such diagrams. The writings of Plato, especially, are dotted with word-pictures of what we frequently term visual aids.*[1] In the same way, the work of Aristotle consists of what scholars are almost unanimously agreed upon are lecture notes; and these notes presuppose the proffer of some kind of written image or design, simultaneously with the delivery of the lecture. In logic especially is this true: the *Organon* is replete with terms and definitions not clear without reference to diagrams. Such technical expressions as "extreme," "middle term," and the like, and several exhortations to "consider the figure," or "look at the figure," apparently bespeak some kind of sandbox or papyrus or board available to the teacher for supplementing his spoken word.[2] Lucretius, it is true, keeps the idea of seeds and planting as his basic figure of speech; but it remains that many of his explanations are primarily directional or involve local motion. Might it not be that the recitation of his great poem could be accompanied by gestures or even drawings indicating the locomotion of the "atomic" principles of all things?

* Because of their length, the footnotes are placed at the end of the article.

Spinoza makes occasional use of geometric images to explain his theorems and the logic behind them.[3] The Kantian tables of judgments and of categories, and the parallel pages of antinomies, the Hegelian triadic patterns in so many of his works, Spengler's mammoth charts, Carnap's drawings to make obvious the distinction between two kinds of logic—these and many more are very likely adequate testimony to the fact that philosophers are convinced that mind and eye move together.

Particularly fortunate in this connection has been logic, which, more than any other branch of philosophy, has been suited to the construction of visual patterns. Now just where the static patterns leave off and the realm of logic machines, which not only illustrate problems but undertake to solve them, begins is another question, which we here leave aside. Perhaps the two types of aids do overlap; but the description of logic machines is apart from our present purpose, which, being pedagogical only, is rather more humble. The fact remains, however, that in addition to Aristotle, such men as Psellus,[4] Raymond Lull, Leibniz,[5] Euler,[6] Lambert,[7] Hamilton,[8] Jevons,[9] Venn,[10] Frege,[11] Peano,[12] and others were distinguished originators of visual aids to the study of logic—always, of course, *their* logic. Either they devised symbols whose express purpose was to clarify by impressing the eye with designs easily grasped, combined, and remembered, or they worked out spatial designs whose mere inspection would aid in apprehending logical relationships. It is the object of this paper to take an old device, the feltboard, which has for some time been employed in elementary and secondary schools, and show how it can be applied to the teaching of logic—often using modifications, or even copies, of the very designs which these men, some of them many centuries ago, suggested.

A feltboard is, mechanically speaking, very simple and quite inexpensive, and it enjoys a sufficient number of advantages over other visual aids, such as the chalkboard (blackboard), to make it well worth while. Details of its construction, in many styles, are given in various articles and chapters from books on audio-visual equipment.[13] Suffice it to say here that it is basically a sheet of felt stretched over a piece of plywood or other flat board, of a size to suit the convenience of the lecturer, but probably measuring anywhere from two feet by three feet, to three or four by five feet. The felt is sufficiently rough textured so that another, smaller piece of felt will adhere immediately to it and remain supported, without tacks or adhesives. The virtue of the device is that cutouts, to be

called "spotters" in this essay, can be prepared in advance, and these spotters may be very simple or quite complicated—figures which might be far beyond the capability of a logician to improvise on a chalkboard under the critical gaze of his students. The process of flocking, whereby a finely shredded fabric is sprayed by a small air gun upon a surface made sticky by wet enamel paint, is a largely satisfactory substitute for the felt sheet, and holds the same spotters. Another version, using a slightly different principle, consists of a metal covering for the board instead of felt, and requires cardboard spotters to which are glued small magnets.

The question is, then, just what do you wish to prepare in advance for use with, say, an elementary course in logic which is to include something of both classical and recent logical developments? The rest of this paper is a brief summary of certain suggestions found useful in a course of this sort. Other suggestions will recommend themselves to the teacher when he has supplied himself with pieces of felt in several colors (or the cardboard and magnets), a pair of scissors, a ruler and compass—and perhaps a wife to do the actual cutting.

1. Let us start with truth-tables, and begin with the simplest combinations of p and q, any two propositions.[14] The lecturer will prepare for himself these two letters, each one preferably about three inches high. They will be visible clearly in a room containing 60 or 80 students, and what is more, from a very acute angle at the side of the room; for the feltboard, unlike the chalkboard or even bristolboard posters, picks up no highlights, and can be seen obliquely with no difficulty. Next, the lecturer will want to provide himself with a dozen or so small round spotters of black felt (he only *requires* eight, but it is well to be abundantly supplied), and another dozen of some strongly contrasting color. The spotters can be approximately the size of a quarter. They will be clearly visible on the grey or brown or other neutral background. Black will stand for the false values of p or q and their connectives, and the color, say yellow or red or blue, will represent the truth-value T. It will be a very simple matter to place these in rows and columns, one after the other, and they will be several times more legible than truth-tables chalked out in the usual fashion, where T is indistinguishable, virtually, from F.

For connectives themselves, a small dot, with half the diameter of a penny, will do for "and," a horseshoe scaled to the p and q will tell us that "if . . . then" is being considered, and a v may be cut for

"or." "Or else," the exclusive alternation, takes two v's and the biconditional is made of three short scraps. This all sounds like tedious cutting, but once prepared, these spotters can be used over and over, and for new purposes as well.

If one compounds three propositions, p, q, and r, one needs more spotters, but the scheme is the same. Generally, rather few truth-tables containing more than two propositions are exhibited anyway.

2. The diagrams for syllogisms have been among the most puzzling in all logic, and although textbooks have pretty well settled on Euler or Venn circles, or upon the alternating use of both, still the more critical discussions, such as one might find in Welton[15] or Keynes[16] propose further alternatives and show the difficulties inherent in using any of them. Certainly the Euler circles are both popular and venerable.[17] For the feltboard, they should be cut out of, say, red felt. The largest, which will indicate the major term, will be an inch or an inch and a quarter thick—it does not pay to have too slender circles for they wilt while being applied and will not adhere: a ratio of not more than six to one, length or diameter to width, is about right for any spotter of whatever shape. So the outer perimeter of the "major" circle is six or seven inches. The next circle is immediately cut from the residue of the major, and can be less thick correspondingly. The subject term is cut from the residue of the middle, and may in fact be left solid. It is a good plan to have two or three, or even four sets of syllogistic circles, and if they are made of contrasting colors they can be interchanged, for great visibility or for illustrating some further logical doctrine about distribution or similar feature of the terms. An Aristotelian sorites is not hard to construct: one black spotter is simply added in the very center of the circles, and this gives the fourth term.

3. To illustrate the kinds of opposition between terms, cut some kind of figure—anything, a dog, for instance, if you are equal to the task, or a square, or whatever you choose—from a bright color, say yellow. If the residue of felt is large enough so that you have a piece remaining that is about two inches thick all-round, you can easily illustrate the meaning of "contradictory": the dog is A, the residuum is everything else in the universe, nondog, -A. Then cut out another dog to match the first, but make it of blue or red. This will illustrate contrariety—the substrate is the same, dog, but the qualities are as far apart as possible. Now cut out a tree, in any color, and take two small dots of felt to represent eyes. You may quickly show a class that the eye of the dog is appropriate to that

animal, that removing the eye constitutes a privation, blindness, whereas removing an eye placed on the center of a tree is no privation of a positive state. (This account follows Aristotle's theory of the so-called post-predicaments.) With these spotters, too, you may illustrate a number of interesting things about the calculus of relations, and carefully distinguish kinds of relational terms.

4. You now have some natural objects, e. g. dogs and trees, and can deal with the problem of signs and signification. If you fasten pieces of ordinary sandpaper, of not too fine a grade, to cardboard or bristolboard, using rubber cement, you will be able to print names on the other side and then spot these little placards upon your feltboard (although not upon nylon flocking, they will not adhere). Or you may wish to write names such as "dog" or "Fido" on the chalkboard next to your feltboard illustration. With these simple aids, the whole theory of signs begins to take on a more concrete meaning for beginning students. And furthermore, with a cut-out dog it is often much easier to make the point that abstract notions, such as loyalty, are incapable of existing except as they designate, obliquely, the qualities of things—they cannot exist as detached entities.

5. Induction now becomes easy. You may re-employ your black and colored spotters described in connection with truth-values. Make some arrows, of any color, about four inches long. Make a few square spotters, about the size of a match folder, in two colors. This is all that is needed to show possible relations between cause-factors and effect-factors in any rule of induction except concomitant variations. The rounds will be causes, the squares effects, and for the sake of clearness felt arrows should run between. It is then a simple matter to run over the canons of induction found in Mill[18] or the figures of demonstrative induction found in Johnson.[19] This presentation would, of course, be supplemented by verbal descriptions of simple problems.

6. The theory of probability, if you wish to introduce the time-honored methods of calculating frequencies, becomes very simple. Instead of the cards in a deck (and it is surprising, but many students seem to have difficulty recollecting the numerical facts about a pack of cards) or marbles in a bag, you may use the spotters on the board. It is not important whether you see them as you draw, and if you do wish to preserve the element of surprise, you may avert your eyes when plucking a spotter from the board. Independent alternatives and conjunctives may be illustrated with small rounds in

two colors, dependent inclusive alternatives by rounds and squares each in two colors. This procedure is less disturbing to a class than that of drawing from a bag, which seems to penalize all but the front row of students, and which tends to confuse the epistemic factor of surprise and doubt with the constitutive problem of calculating chances.

7. The design of experiments, discussed by R. A. Fisher and other statisticians, is admirably suited to illustration on the feltboard.[20] Plots of ground, replicated trials, are much better depicted in this fashion than by laborious drawing of squares. If necessary, you may cut out arabic numerals, to number rows, etc., or you may use sandpaper and bristolboard. A rough-and-ready way of numbering is to cut several strips of felt the same length, then quickly build Roman numerals out of them on the board.

8. An axiom system can first be modeled and then systematically discussed with the help of the board. Wilder furnishes an excellent set of axioms and theorems, and the model for this is four points—four of your quarter-size spotters.[21] The geometry of seven points can be illustrated with no more trouble.[22] You may have a student read off axiom after axiom in class, and as he reads you may, so to speak, follow his dictation by placing the spotters required by the axioms on the board. The mathematical necessity by which the theorems follow axioms will be better apparent this way than any other. More complex systems of geometry or logistics may be set up, with lines or figures or other symbols, all on the same principle. (Lines had best be made of flocked cardboard for stability's sake.) If you wish to discuss the *theory* of axiom sets, it would be well to cut out a few Greek letters as initials for axiom, definition, system, theorem, and such.[23]

These, then are a few suggestions. What is more important to remember is that the feltboard is neither a machine nor a final image of Holy Writ.

Unlike Jevons' logical piano, or even Cunynghame's syllogistic cards,[24] unlike the digital computers from Simple Simon to Binac,[25] the feltboard solves no problems, it merely shows some of the more obvious logical principles involved in considering the problems. It is a device, therefore, of logical theory much more than of logical technic, of *logica docens* rather than *logica utens*. It aids the mind through the eye, it does not supplant the mind for any operation at all.

Furthermore, if one adopts a feltboard for teaching, one must be careful to use it with a freshness of approach each time. Students are very quick to snatch up the notion that logic—or any other division of philosophy, for that matter—is cut-and-dried, that the syllogism was once and for all symbolized correctly by, say, Leonhard Euler; and the great impressiveness, through its use of color, of the feltboard is likely to deepen that conviction. Consequently the teacher who fails to keep inventing new applications, new interpretations, who loses his amateur touch, is bound to be robbing his students of one of the greatest pleasures in learning logic—the fact that it is a dynamic and intensely controversial discipline whose boundaries and purposes are constantly being re-examined.

FOOTNOTES

1. The extremely difficult passage on the construction of the world-soul, *Timaeus* 34 C-36 E, would be even less intelligible without the image of crossed strips with which Plato helps us. One of the more obvious examples of a visual aid in Plato is described in *Republic* VI, 509 E, where a line is divided (in a very peculiar way, it turns out) and each division and subdivision accorded special significance illustrating being or knowing. See, Robert S. Brumbaugh, *Plato's Mathematical Imagination* (Bloomington: Indiana University Press, 1954). Plato's "imagination" is not co-extensive with what is merely visible and ordered, but it can be abundantly illuminated by the several score "diagrams" which Brumbaugh finds buried in the text. Plato, by the way, looks upon sight as the sense of greatest benefit to our intellect—*Timaeus* 47 A.

2. Aristotle, *Prior Analytics*, I, 4, 25 b 31-26 a 1. For important notes on this, see Sir W. D. Ross, *Aristotle's Prior and Posterior Analytics: A Revised Text with Introduction and Commentary* (Oxford: At the Clarendon Press, 1949, *ad loc.*

3. See, for example, the scholium to Proposition 15 in Book I of the *Ethics*. The famous illustration of the proper defining of a circle in the *Improvement of the Understanding* is another case in point.

4. Of the period of Psellus and shortly after, William Stanley Jevons, in his *Studies in Deductive Logic: A Manual for Students* (Third edition; London: Macmillan and Company, 1896) says: "During a visit to Italy in 1874, I was much surprised and interested by the multitudes of curious diagrammatic exercises to be found in theological MSS. of the great public libraries of Italy. The abundance of these diagrams shows that rudimentary logical exercises were very popular in the country where, and at the time when, the dawn of modern science began to break. I estimated that a single MSS. in the Biblioteca Communale . . . contained at least 800 such diagrams . . . . The MSS. containing these (among others) is assigned in the printed catalogue to the 11th or 12th Century . . . "—Preface, p. xxii.

5. For light on this material, consult Clarence I. Lewis, *A Survey of Symbolic Logic* (Berkeley: University of California Press, 1918), *ad loc.* Leibniz lived during a century when many of the leading mathematicians wished to find visual or even mechanical methods of solving difficult problems—Descartes, Pascal, Napier, *et al.*

6. *Letters of Euler to a German Princess on Different Subjects in Physics and Philosophy*, translated from the French by Henry Hunter (London: H. Murray, 1795) 2 vols. See Letters CI-CVIII, written between February 10 and March 7, 1761.

7. J. H. Lambert, *"Sechs Versuche einer Zeichenkunst in der Vernunftlehre"* in *Johann Heinrich Lamberts logische und philosophische Abhandlungen*, edited by Johann Bernoulli (Berlin: 1782) Vol. I. A number of diagrammatic devices are found scattered through these papers. For brief accounts, see Lewis, *op. cit.*, and J. Welton, *A Manual of Logic*, 2 vols. (Second edition, London: W. B. Clive, 1901). See also Lambert's *Neues Organon* (Leipzig: Johann Wendler, 1764).

8. Sir William Hamilton, *Lectures on Metaphysics and Logic*, edited by Henry L. Mansel and John Veitch (Edinburgh and London: William Blackwood and Sons, 1874). See especially the Appendices to Vol. IV: Appendix VI (c), (d), (e), (f).

9. In his *Studies in Deductive Logic*, Jevons slightly modifies the Euler circles, p. 52. See also his *The Principles of Science: A Treatise on Logic and Scientific Method* (Special American edition; New York: MacMillan and Company, 1874), which contains a description of the logical abacus (p. 119-23) and the logical machine (p. 123-31), the latter being sometimes dubbed the logical piano. See further W. Mays and D. P. Henry, "Jevons and Logic," *Mind* LXII, 248: p 484ff (October, 1953) for a discussion of this machine in relation to the theory behind it.

10. John Venn, *Symbolic Logic* (London: MacMillan and Company, 1881). This is one of the most important books to consider spatial representation of logical forms: its contributions are chiefly contained in chapters 5 and 11. There is an interesting historical summary given in chapter 20; here Venn lists no fewer than 25 ways in which "No S is P" can be indicated symbolically. We must remember that Venn was writing three-quarters of a century ago; the additions to this list are no doubt overwhelming by now.

One notes that Venn has a difficulty in separating symbolism from geometrical representations, a difficulty quite similar to one that perhaps ought to be raised in the present essay. But in the case at hand there would be little purpose served in making the separation: both symbols and designs can be shown clearly on the feltboard.

11. Gottlob Frege's rather notorious diagrams were first expounded in his *Begriffschrifft, eine der arithmetischen nachgebildete Formelsprache des reinen Denkens* (Halle, 1879). The first chapter of this is rendered into English in Peter Geach and Max Black, *Translations from the Philosophical Writings of Gottlob Frege* (Oxford: Basil Blackwell, 1952), p. 1-20. There is a brief account in Joergen Joergensen, *A Treatise of Formal Logic* (Copenhagen and London: 1931) 3 vols.

12. Giuseppe Peano and Others, *Formulaire de Mathématiques* (Turin: 1895-1908).

13. Some of these details were first explained to me by Donald A. Ingli, director, and Rolland P. Schlieve, assistant director of Audio-Visual Aids at Southern Illinois University, and I wish to thank them here.

14. The Wittgenstein truth-tables make their first appearance in his *Tractatus Logico-Philosophicus* (London: Kegan Paul, Trench, Trubner, and Company, 1922) par. 4.31.

15. Welton, *op. cit.*, contains a good chapter on the value of these circles, and other diagrams of propositions, and syllogisms.

16. John Neville Keynes, *Studies and Exercises in Formal Logic* (Third edition; London: MacMillan and Company, 1894), Part III, chapter 4.

17. Venn, *op. cit.*, p. 100 n., says: "Until I came to look somewhat closely into the matter I had no idea how prevalent such an appeal had become. Thus of the first 60 logical treatises, published during the last century or so, which were consulted for this purpose . . . it appeared that 34 appeal to the aid of diagrams, nearly all of these making use of the Eulerian Scheme."

18. John Stuart Mill, *A System of Logic, Ratiocinative and Inductive* (Eighth edition; London: Longmans, Green, Reader, and Ryer, 1872), Book III, chapter 8.

19. W. E. Johnson, *Logic*, Volume II (Cambridge: At the University Press, 1922). Chapter 10 is on demonstrative induction, the type most nearly in accord with Mill's methods, and easily presentable by the same visual means.

20. Ronald A. Fisher, *The Design of Experiments* (New York: Hafner-Publishing Company, 1947). See particularly chapter 5.

21. Raymond L. Wilder, *Introduction to the Foundations of Mathematics* (New York: John Wiley and Sons, 1952), chapter 1.

22. Morris R. Cohen and Ernest Nagel, *An Introduction to Logic and Scientific Method* (New York: Harcourt Brace and Company, 1934).

23. Wilder, *op. cit.*, chapter 2.

24. Described in Jevons, *Studies in Deductive Logic*, chapter 11. A modified form of these cards is given in Martin Gardner, "Logic Machines," *Scientific American* 186:71; March 1952.

25. Edmund Callis Berkeley, *Giant Brains, or Machines That Think* (New York: John Wiley and Sons, 1949). See especially chapter 9, which furnishes a short account of the relation of symbolic logic to electric relays. These could well be illustrated on the feltboard, preferably with flocked lightweight cardboard strips.

BOOK REVIEWS

DALE, EDGAR. Audio-Visual Methods in Teaching. Revised edition. New York: The Dryden Press, 1954. 534 p.

Reviewed by

•PAUL W. F. WITT

Edgar Dale took seriously the job of revising his *Audio-Visual Methods in Teaching*. As a result, the revised edition of this textbook is practically a new book. And an excellent book it is.

The thousands of teachers, supervisors, and administrators, the hundreds of instructors and consultants of preservice and inservice teacher-education courses and workshops, and the many audio-visual administrators and building coordinators who know the original edition and who have found it such an enlightening and useful guide to the improvement of teaching and learning will undoubtedly be delighted with the revised edition. Although the book has been completely rewritten, they will recognize it as an old friend, but a friend who has a more mature point of view and whose rationale for using audio-visual materials in instruction has been clarified and strengthened. They will also discover a great many new examples of the use of these materials for teaching and learning at all levels of education. They will find that with rare exceptions the pictorial and graphic illustrations of the first edition have been replaced with new ones. A careful comparison of the two editions will impress them with the fact that Dale has succeeded to a very great degree in his effort " . . . to present a thorough-going rethinking of the entire audio-visual field—both of its theory and practice." Even those quite familiar with the original edition will learn much and will be inspired anew by reading the revised edition.

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Educational workers who discover Dale for the first time by reading the new edition, especially those who have made no previous study of the field of audio-visual instruction, are in for a great experience. In this book they will find a lucid and convincing presentation of a psychologically and pedagogically sound basis for using audio-visual materials and methods in teaching; a clear description of every type of audio-visual material and device; and numerous interesting illustrative reports of significant uses of these materials and devices in major subject-matter areas and at every level of instruction.

Once again Dale has not left his reader in any doubt about the nature of his book. In his first sentence he tells him: "This is a book about the use of audio-visual materials in teaching—materials that do not depend primarily upon reading to convey their meaning." Then he indicates the basic premise of the book by saying: "It [the book] is based upon the principle that *all* teaching can be greatly improved by the use of such materials because they can help make the learning experience memorable." Throughout the entire book, Dale has kept his attention and the attention of his reader sharply focused on his subject.

Early in his presentation and in many subsequent places Dale makes it clear that he is writing to an audience of teachers, particularly those who are still students in teacher-preparing institutions. He does this by addressing them directly. His frequent references to teaching situations and his many examples of the use of audio-visual materials in representative classrooms are added evidence that he is concerned about the teacher and his day-to-day use of these materials. Although he is not quite so direct in addressing teachers already in service, they as well as the preservice teachers should find this book of great practical value.

While the general organization of the revised edition is much the same as that of the original edition, there has been some shifting of content and the addition of much new material. As in the first book, Part I of the revised edition discusses the *Why* of audio-visual education, Part II deals with the materials of the *What*, and Part III, the *How*, presents illustrations of the use of these materials in the education programs of elementary and secondary schools.

A comparison of Part I of the revised edition with Part I of the original book will show how the author has extended and refined his thinking on learning and instruction and on the role of audio-visual materials in them. In fact, his presentation in the first three chapters of Part I is an admirable example of a brief but rather in-

clusive and clearly understandable statement of the nature of learning, how learning takes place, and the function of teaching.

The point of view presented with regard to learning and how it occurs is that which is currently held by many other leading educators: Learning is a change in the behavior of the learner and it comes about as a result of his experiences. Specifically, Dale says: "The final goal of education is not memorized information; it is a changed individual, who lives differently because he has learned." In connection with the point that "experiencing" is a desirable method of learning, Dale says that the key idea of his book is:

> Education must become the rich, active, personal, and adventuresome thing it is when a father teaches his son how to make a model plane, or a mother teaches her daughter how to bake a cake, or a Scout leader explains to youngsters how to find their way in the woods without a compass, or a dramatics teacher coaches a play. For in all these situations learning has motivation, clarity, and use to such a degree that permanence can almost be taken for granted. It has, in addition, a train of other qualities—such as pleasureableness, emotional gratification, and a sense of personal accomplishment. Learning is emotional as well as intellectual.

Attention is also given to matters such as needs, individual differences, readiness, motivation, use, forgetting, and remembering. There is still great concern about verbalism, its hindering effect on education and the pressing need for providing meaningful experiences through the use of audio-visual materials and methods as well as through direct contact with reality. Emphasis is placed on education for "permanent" learning.

Although he gives major attention to knowledge as an outcome of learning (a very important goal and one most worthy of careful attention and the very best efforts of all teachers), he stresses the very great importance of the development of concepts and generalizations and the building of the desire and ability to act on them. There is no question in his mind about the danger and futility of stopping with the acquisition of information as an end-product of education. Furthermore, he devotes considerable attention to the importance of problem-solving. The significance of human-relations education is highlighted and discussed at some length. (A new chapter on this subject has been added in Part III.) He gives examples of the use of audio-visual materials in the development of motor-activities (e.g. drivotrainer instruction), and he has included (also in Part III) a chapter on The Humanities in which he is concerned about the use of these materials in the teaching of art, music, and foreign languages.

In discussing the teaching function, Dale reports that "Students say that they like teachers who are 'sympathetic' and who also 'explain things well'." He points out that teaching is essentially a

form of communication. In his very first chapter and at several other points in his book he stresses this idea. Succinctly he says: "Good teaching is essentially good communication, and good communication requires sympathetic sharing and clear explaining, . . ." Dale also recognizes that teaching is a matter of helping guide the experiences of learners (a popular position held by recognized educational leaders) for at another point in discussing the outcomes of education he asks the question: "What experiences must I help my students to undergo if they are to reach the goals we have agreed upon?" Not only does this quotation indicate Dale's acceptance of the guidance function of the teacher, but it also shows again his agreement on the experiential nature of education.

The role of audio-visual materials in teaching and learning is the focus of attention in Chapters 4, 5, and 6. Dale's well-known "Cone of Experience" (with television added and pictured more accurately as a cone instead of as a triangle) appears in the revised edition (p. 43, 198, and 347) and is the basis of Chapter 4. In this chapter Dale describes each of the audio-visual materials and devices listed on the various bands of the "Cone," indicates their strong and weak points, and indicates their potential contributions to teaching and learning. While he refers to the "Cone" frequently (and at several other places in the book), he makes it clear to his reader that "*It* [the "Cone"] *is merely a visual aid* in explaining the interrelationships of the various types of audio-visual materials, as well as their individual 'positions' in the learning process." Dale recognizes the limitations of his explanatory device. He is clear on the point that the "Cone" represents relative levels of abstractness, not difficulty. He is aware of the overlapping that exists and the undesirability of considering the bands of the "Cone" as representing fixed classifications.

Chapter 5 is in large part new. It is entitled, "What Can Audio-Visual Materials Do?" The answer given to this question is a summary statement on the findings of the research that has been done in the field of audio-visual instruction.

What was done in Chapters 2 and 3 of Part III of the original edition is now done in Chapter 6 of Part I of the revised edition under the title, "Using and Evaluating Audio-Visual Materials." This chapter, like all other parts of the revised edition, has been thoroughly and effectively redone.

Part I concludes with a chapter devoted to a consideration of "Basic Sources of Audio-Visual Materials."

Dale's commitment to audio-visual instruction is a rational one. "They [audio-visual materials] offer no cure-all for the ills of the classroom." "Books . . . are essential." " . . . we believe in these materials but insist that they be used with temperateness, insight,

and judgment." His belief in the value of these materials is based on a thorough knowledge of the field and long and varied experience with the successful use of these materials and methods. He is convinced that audio-visual materials . . . have come of 'age'." He thinks that this is a fact now widely accepted by educators. Throughout the entire book he keeps his attention focused on the educational function to be performed with these materials. Audio-visual materials and methods are means, not ends. Dale shows clearly that their use is not gadgeteering but a desirable way to improve the quality and effectiveness of teaching and learning.

Everyone who uses this book should read Part I thoughtfully and in its entirety. Frequent reference to it as the remainder of the book is studied is desirable, a practice which Dale encourages and facilitates since in many places in Parts II and III he is quite explicit in showing how the point he is making is related to or rests upon a basic idea or ideas presented in Part I.

The chapter organization in Part II is similar in the revised edition to that in the original book except for the inclusion of two new chapters. One is entitled "Educational Television," the other "Color as an Aid in Teaching."

The presentation on educational television is general in nature as it would have to be in a textbook of this kind. The strengths and weaknesses of television as a communication medium for education are identified and specific suggestions are made for using television for educational purposes and for helping children and youth become more discriminating viewers. Some hints on producing a school telecast are included.

The chapter on color is a unique and highly significant contribution to the audio-visual literature. It challenges educators to give more attention to the use of color in teaching. After presenting some background information on the nature and use of color, Dale describes how color may be used in teaching to emphasize certain factors, to make certain distinctions evident, and to achieve greater realism in the use of certain materials. He also indicates how color may be used to secure more satisfying emotional and esthetic responses to the learning environment. He concludes by offering some suggestions for using color and by giving some pertinent facts on color harmony. His verbal presentation is richly and effectively complemented by the use of a variety of pertinent color illustrations. Once again Dale has pointed the way for workers in the audio-visual field.

In Part III Dale presents numerous examples of the use of audio-visual materials and methods in subject-matter fields at the elementary- and secondary-school levels. While in Part III of the original edition attention is focused solely on the use of these ma-

terials in various subject-matter fields and the presentation is most often organized in terms of types of materials, a much broader and more modern approach to the curriculum is evident in this section of the revised edition. A new chapter, "Planning, Organizing, and Evaluating," introduces this part of the book. In it the author sets forth a number of factors regarding the physical and psychological environment essential to good learning and the effective use of audio-visual materials. Recognizing that the nature of an educational program may vary from one based on a rigid, specifically-defined course-of-study to one organized around a series of general themes he tells in some detail how a teacher might deal with the topic, "We Explore Our City." In doing so, he stresses the importance of determining objectives, relating learning to learner needs and interests, providing opportunities to practice new learnings, and evaluating learnings and the learning experience, particularly the audio-visual materials that are used. Two illustrative "lesson plans" are presented. Some facts and ideas about the use of duplicated materials in teaching are included (somewhat illogically) at the end of this chapter.

The examples presented in the chapter, "Human Relations in Education," which follows the introductory chapter in this section of the book, and the examples described in the chapter on "The Humanities" which appears toward the end of this section are added evidence of the author's concern for a broad interpretation of the curriculum. Even in the chapters devoted to descriptions of the use of audio-visual materials in the subject-matter fields much of the material presented is organized in terms of learning units rather than around various types of audio-visual materials and methods.

The concluding chapter in Part III, which is also the last chapter in the book, deals with the organization and administration of audio-visual programs. Briefly, and in the manner of a teacher committee chairman, Dale describes the initiation and development of an audio-visual program in a one-school situation. Then by describing the duties of an audio-visual administrator he gives an over-all picture of what is involved in administering a system-wide program. Obviously, Dale's treatment of the business of organizing audio-visual programs is general and limited in scope. He recognizes this, pointing out that a book could be written on it. He reminds his reader, too, that this is work for the trained specialist. Since his audience is teachers, it seems quite in order that he not get deeply involved in the details of administration.

It has already been stated that almost all the pictorial and graphic illustrations are new and that the chapter on color is pro-

fusely illustrated with colored pictures, diagrams, charts, and graphs. However, it should be emphasized that a superior job of illustrating this book has been done. There is a pleasing variety of illustrations which by example give the reader a good idea of the range of such materials and how they can be used in teaching. The illustrations are of good quality. They are located in the book where they are appropriately related to the text.

The serious student as well as the responsible instructor who uses this book will welcome the study helps that are given at the end of each chapter. In addition to suggested questions and projects, the author has listed study materials including films, filmstrips, and recordings as well as books, pamphlets, and articles. Where appropriate, sources of information, materials, and equipment are given. A particularly desirable feature of the suggested questions and projects is that they encourage students to do things which will enable them to put into practice and test ideas presented in the book. Careful attention is given to the importance of relating these projects to the interests and previous experiences of learners.

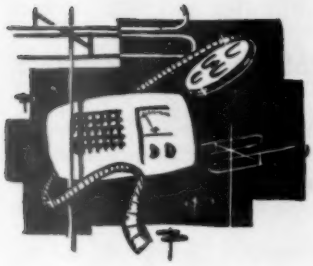
Another very attractive feature of this book is the style in which it is written. Idea after idea is presented easily, naturally, and in a manner which makes clear the relationship of these ideas. The manner of addressing the reader directly and of referring to the author's own experience or that of his students and colleagues establishes a high degree of rapport. There is genuine respect for the reader. At no point does the author talk down to him. The entire content of the book has been carefully organized and there is a unity of presentation that is strengthened by the author's careful and consistent practice of frequent summarization both at the end of a section and by way of introducing a new section. Also as reported above, his efforts to make explicit the relationship of points in Parts II and III to the principal ideas developed in Part I tend to unify his entire presentation. He has ever been careful to document his arguments. The reality, human interest, and the humorous quality which characterize his examples make the book highly interesting and increase significantly its effectiveness as a channel of communication.

A review of this book would not be complete without some comment on the publication job itself. The type used, the double-column format, and the use of headings make for easy reading. The general design and the arrangement of illustrations are attractive, interesting, and functional. The book is enclosed between covers of an attractive, distinctive, modern design.

The reader of a critical review of a book such as this is meant to be is likely to expect a number of negative comments. Admittedly, this review is lacking in this respect. The reason is simply that this

book is an excellent piece of professional writing. Obviously, it does not cover the entire field of audio-visual instruction in every detail. Undoubtedly the author did not propose to do so. It is to be expected that instructors of students in courses in audio-visual instruction will find that they need text material other than this one to teach some of the things they wish to teach in their courses. But a good instructor does not rely on a single textbook. In fact, instructors who share Dale's concern for the development of a thoughtful and critical attitude on the part of their students will undoubtedly encourage them to study many other books on audio-visual instruction, those that are more specialized than this one as well as the other good general references that are available.

Audio-Visual Methods in Teaching, revised edition, is an outstanding book. Its contribution to the improvement of teaching and learning will be considerable. Every educational worker in the field of audio-visual instruction should be pleased and proud about this addition to the professional educational literature. Edgar Dale should enjoy the satisfaction that comes from doing well an important job.



FILM

•ROBERT W. WAGNER

THE UNIVERSITY FILM PRODUCERS ASSOCIATION

A REPORT ON THE ORGANIZATION AND ITS RECENT CONVENTION

A story well-known in film circles involves the famous Hollywood producer whose reaction to "idea" films was summed up in a single sentence: "Messages are for Western Union!"

Today a group of nontheatrical film makers is busy proving that while Western Union may still carry messages, the motion picture can and must also be used to transmit significant ideas, and do this without being dull or pedantic. This group, known as the University Film Producers Association, operates on the premise that the most important use to which film can be put is to communicate ideas. Its work is based on that concept of film making which recognizes that it is practically impossible to put together a set of pictorial and verbal images in motion picture form without dealing with ideas.

The UFPA is unique in the history of motion picture making. Organized in 1947 at Iowa University, it began as a dozen film makers working in universities and colleges gathered to talk over common problems, most of which were, at that time, technical in nature.

In August 1954, the Eighth Annual Conference of the Association, held at The Ohio State University, was attended by more than 130 writers, directors, producers, cameramen, and film technicians from 52 colleges and universities in 28 states, Canada, and the District of Columbia. In addition to 125 active members, there are now

Robert W. Wagner is Director of Motion Picture Production, The Ohio State University, and newly elected president of the UFPA.

55 associate members coming from educational television stations, armed forces film units, and state departments of education. There are also 17 sustaining members including representatives from major motion picture production equipment companies and film laboratories.

The purpose of the organization, as stated in its constitution, is:

> . . . to further and develop the potentialities of the photographic and recording arts in improving instruction and communication. To fulfill this purpose and to promote the production of these types of materials by recognized educational institutions and groups officially affiliated with educational institutions, this association shall for its members:
> 1. serve as a central source of information on production by educational institutions
> 2. provide a means for the sharing of ideas on the various activities involved in and production and distribution of photographic and audio materials.

The UFPA today is an organization growing out of universities and colleges where the production of teaching, research, documentary, and informational films is gradually coming to be supported through the purchase of more and better production equipment, provision for more adequate working space, and, most important of all, the development of a growing corps of professional film makers.

Among the officers of the Association are Robert W. Wagner, Department of Photography, The Ohio State University, president; O. S. Knudsen, Visual Aids Production, Iowa State College, vice-president; Richard C. Polister, Audio-Visual Education Service, University of Minnesota, secretary; William A. Drake, Department of Photography, The Ohio State University, treasurer.

The Association, through committee activity, maintains relations with educational television organizations, keeps in touch with film festivals in this country and abroad, concerns itself with the improvement of motion picture teaching programs and curriculums in universities and colleges, evaluates equipment, is working on standardization of motion picture nomenclature, and is studying problems of film distribution.

The *Journal* of the UFPA is a quarterly publication devoted to the presentation of information, technical and theoretical, of value to the producer of the educational film, and to the student of communication. The proceedings and key speeches of the Annual Conference are reported in the *Journal*, together with book and film reviews, and articles of special interest to the professional film maker in the nontheatrical field. Distributed free to active, associate, institutional, and sustaining members, the publication is available on a subscription basis to nonmembers. The editor is John Mercer, Radio-Television-Film, State University of Iowa, Iowa City.

The biggest function of the Association is its Annual Conference. Held in previous years at the State University of Iowa, University of Minnesota, Pennsylvania State University, University of Oklahoma, Indiana University, Syracuse University, and the University of Southern California, this year's meeting had The Ohio State University as its site. In 1955, the group will meet at the University of Colorado, and in 1956 at the University of Mississippi.

The UFPA Conference is a shirt-sleeve meeting lasting five days, during which time members live and eat together in university dormitories, and meet in an atmosphere of almost constant shop talk. Informality is the order of the day.

The bulk of the program consists of panel and round table discussions of various phases of audio-visual communication, sometimes led by a member, sometimes featuring experts outside the organization. Some of the topics on this year's conference program included: "Ideas on Cinematography," "Music for Motion Pictures," "Developments in Magnetic Tape Recording," "Financial Support for Nontheatrical Film Production," "Patterns of 16mm Distribution," "The Training and Future of the Nontheatrical Film Worker," and "Expanding Concepts of University Film Production."

Robert B. Hudson, Program Coordinator, the Educational Radio and Television Center, Ann Arbor, and Boris Kaplan, Film Supervisor of the Ford Foundation Radio-Television Workshop's "Omnibus," participated in a session on "Films for Television." "Background for Seeing" was the title of a demonstration by Professor Hoyt Sherman of The Ohio State University in the University's Visual Perception Laboratory, one of two of its kind in the country. A session on research was conducted by C. R. Carpenter, Director of the Instructional Film Research Program at Pennsylvania State University, under the title, "Film Making and the Process of Communication."

The keynote of the 1954 Conference was "The Film-Maker as a Communicator of Ideas." The keynote speaker was David D. Henry, executive vicechancellor of New York University, formerly president of Wayne University, and presently chairman of the Joint Committee on Educational Television.

Against the backdrop of the educational problem we face in the future, Dr. Henry outlined the role of the motion picture, pointing out that "film is an instrument of communication and not an end in itself." He pictured the motion picture as a unique contribution to higher education, but cautioned that the process of film making must be an integral, rather than a peripheral function in a university, one in which all university resources must be brought to bear. He then outlined the functions of film in terms of teaching and re-

search, also characterizing the university film as "one more bridge to community service."

Recalling that 60 percent of all commercial television is on film, Henry saw educational television opening a vast new market for the university-produced motion picture, and referred to the classroom television set as a "ready-made projector" available for such films. He made clear the compatibility of live telecasting and film transmission, and pointed to the fact that the effectiveness of film may be increased when integrated with live material. Film and television presentations, he suggested, should be constructed to create the kind of empathetic effect we get from Cinerama, a type of "feeling into" situations which promotes common understandings and characterizes good communication. Finally, he said, the teacher, the film maker, and the producer of educational television must really care whether the student learns.

The climax of each day's talks and discussions during the Conference is the evening showing of university-produced films. Perhaps in no other group of motion picture makers has film discussion and criticism been so open, frank, and genuinely constructive. The university-produced film has no tougher audience than the university film makers themselves.

A typical screening session, lasting from seven o'clock until 12 in the evening, might go something like this:

A discussion leader introduces each film, reading from a descriptive sheet indicating the purpose of the film, the intended audience, and other pertinent production data, previously supplied by the producer. In most cases, the producer or other member of the production staff is present to make further comment. The film is shown, and a discussion follows, with the producer replying to comments or answering criticism. The discussions commonly run the gamut from questions like "What kind of sound recording system was used?" or "How did you get the shot of the airplane crash?" to "Was this idea really important enough to put on film?" or "Is this presentation honest in its approach to the subject matter?"

This open give and take among practicing film makers creates a unique workshop situation in which the producer gets a candid opinion of his work from his colleagues. This situation tends to stimulate creative thinking about the nature of the nontheatrical film, a fact which may be largely responsible for the steady improvement in the quality of most university-produced motion pictures during the past five years. In addition to the discussion, each member fills out a simple evaluation form for each film shown. These are returned to the producer for further study.

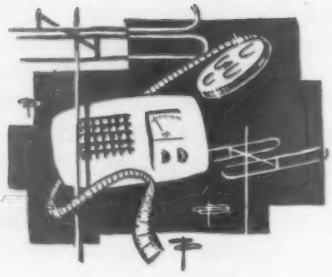
More than 50 recent university-produced films were shown at the 1954 Conference, in a kind of film festival which did not attempt

to either categorize films or award prizes to those which might have been considered "best." Rather, the sole concern was an examination of each film in terms of how well it served its function as a medium of communication, in the light of its objectives, intended audience, and filmic treatment. Each was considered a separate product resulting from differing combinations of needs, interests, production talents, and audience functions.

Spectators at this year's showings saw a rich variety of subject matter and film treatments ranging from a straightforward narrative titled "Picking Peaches for the Consumer," to an animated film called "Story Tellers of the Canterbury Tales," narrated in the English of Chaucer's time. There were serious documentaries like "Cancer Quest," and how-to-do-its like "Dry Paper Modeling." There were also student productions from universities having a teaching program in cinema. These ranged from a one-minute film "Exercise" made by students at the State University of Iowa, to "Time Out of War," made by two students at the University of California at Los Angeles, the latter being a dramatic story film which netted its producers a contract with a major Hollywood studio.

The UFPA film showings and the discussions which go on long into the night, are undoubtedly one of the most important activities of the organization as it now exists. It is the summing up of all values of a group whose fundamental purpose is to improve the quality of film communication in higher education. It is evidence of the thinking of the film maker, a test of his technical skill, of his integrity as a teacher, and of his fitness as a communicator of ideas.

The University Film Producers Association has come to occupy a unique and significant place in the history of the nontheatrical film. Its members, widely scattered in colleges, universities, and other educational organizations throughout the country, are beginning to play a significant role in meeting some of the challenging problems in the field of education. Its effect is to debunk that concept of film making which holds that "messages are for Western Union." Its impact is to promote the production of mature, worthwhile films to inform and stimulate thoughtful people wherever they are shown.



TELEVISION

•DALLAS W. SMYTHE

RECENT BOOKS ON FREEDOM OF SPEECH

When the editor of the REVIEW invited us to undertake a regular column devoted to some aspect of television, we suggested that perhaps a column on something other than the how-to-do-it aspects of TV would be useful. He agreed. The idea as it developed was that one time the column might be devoted to the discussion of a problem, such as violence in the mass media, to which would be brought to bear recent research in the social sciences and other material (this particular topic is scheduled for the second of these columns). Another time, it might be devoted to reviews of particular TV programs of especial interest to educators. Another time, it might be concerned with public policy developments as they are affected by current operating practices of TV stations—and so on.

The topic of the first column was suggested to us by the appearance of a number of books in recent months dealing with various aspects of freedom of speech, coupled with hearings and investigations in the national scene which also bear on the same issue. The relevance of the policy on freedom of speech to the interests of men and women working with audio-visual communications, and especially with TV, should be established.

As citizens and educators the interest of such persons in freedom of speech is obvious. At this level the interest applies equally to all, whether working in newspapers, radio, TV, or face-to-face education. There is another and more immediate level, however, at which a conscious policy on applying the idea of freedom of speech frames the day-to-day operations of TV (and radio) broadcasters. In this respect they are set apart from operators of other mass media, who are not under such an operating policy. Why is broad-

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casting required to follow a different policy on freedom of speech than other media? Because the Communications Act and the Federal Communications Commission require it of broadcasters as a condition of licensing them to use the air waves. Just what does this requirement mean? The Commission summarizes this obligation as follows:

> . . . under the American system of broadcasting, the individual licensees of radio stations have the responsibility for determining the specific program material to be broadcast over their stations. This choice, however, must be exercised in a manner consistent with the basic policy of the Congress that radio be maintained as a medium of free speech for the general public as a whole rather than as an outlet for the purely personal or private interests of the licensee. This requires that licensees devote a reasonable percentage of their broadcasting time to the discussion of public issues of interest in the community served by their stations and that such programs be designed so that the public has a reasonable opportunity to hear different opposing positions on the public issues of interest and importance in the community. The particular format best suited for the presentation of such programs in a manner consistent with the public interest must be determined by the licensee in the light of the facts of each individual situation. Such presentation may include the identified expression of the licensee's personal viewpoint as a part of the more general presentation of views or comments on the various issues, but the opportunity of licensees to present such views as they may have on matters of controversy may not be utilized to achieve a partisan or one-sided presentation of issues. Licensee editorialization is but one aspect of freedom of expression by means of radio. Only insofar as it is exercised in conformity with the paramount right of the public to hear a reasonably balanced presentation of all responsible viewpoints on particular issues can such editorialization be considered to be consistent with the licensee's duty to operate in the public interest. For the licensee is a trustee impressed with the duty of preserving for the public generally radio as a medium of free expression and fair presentation.[1]

We have quoted this language extensively because in the absence of litigation before the FCC or the courts, it is not often quoted or discussed. Our purpose in the present discussion is to raise questions, in the light of the official FCC policy, concerning the adequacy of broadcasters' treatment of public issues, especially those which are controversial. If it be contended that the FCC policy should be revised, then broadcasters and educators alike are entitled to be heard for their recommendations. In any event, it is appropriate to direct broadcasters' and educators' attention in connection with the books summarized below to the questions: What do you think about them? What are you doing about them?

The books to be discussed are *Freedom, Loyalty, Dissent*, by Henry Steele Commager (Oxford University Press, New York, 1954, $2.50); *Supreme Court and Supreme Law*, by Willard Hurst and Others (Indiana University Press, Bloomington, Ind., 1954,

[1] *In the Matter of Editorializing by Broadcast Licensees.* Docket No. 8516 Pike and Fischer, *Radio Regulation* 1:91, 211-12.

$4.00); *How Human Rights Got into the Constitution,* by Zechariah Chafee (Boston University Press, Boston, 1952, $2.50); *But We Were Born Free* by Elmer Davis (Bobbs-Merrill, New York, 1954, $2.75); and *I Protest,* by G. Bromley Oxnam (Harper, New York, 1954, $2.50).

The five books before us approach the subject in different ways and with different tempers. Some are earnestly rational. Another is vigorously ironic. One is frankly angry in tone. Possibly the most general and most measured statement of the issues and of the argument for freedom of speech is given by Professor Henry Steele Commager in *Freedom, Loyalty, Dissent.* Three of the five chapters of this book are based on articles published in different magazines. Two of them are published for the first time. The first of these, "The Necessity of Freedom," sets the tone for the book. In it, Professor Commager reviews the basis for freedom of speech (and of the press) as being derived from our imperative *need* for them.

> We do not protect freedom in order to indulge error. We protect freedom in order to discover truth. We do not maintain freedom in order to permit eccentricity to flourish; we maintain freedom in order that society may profit from criticism, even eccentric criticism. We do not encourage dissent for sentimental reasons; we encourage dissent because we cannot live without it. (p. 18)

Commager presents attractively the array of arguments for freedom of speech; the constitutional or legal argument; the natural rights argument; and the pragmatic argument. The pragmatic argument is that judged by its consequences (and by the consequences of its deprivation) we cannot afford to do without freedom of speech. Pointing out that our courts have been "a bit obscure" in handling the legal issue, he prefers the arguments derived from both the natural rights (transcendental) and the pragmatic approaches. These two quite different arguments (the ideal and the practical) have blended in the history of our freedom-concept. "Past generations have preferred one or the other . . . : it has remained for ours to pay lip service to both, and to ignore both. Uncertain of principles, we fall back on emotion; unfamiliar with the past, we are afraid of the future." (p. 11)

Pragmatically, the issue is: What sort of effects can we expect from the currently mounting attacks on dissenters? Professor Commager answers that the first consequence will be the development of some standard of orthodoxy (or loyalty). The porousness of all yardsticks thus far advanced by those who would silence nonconformity provides some basis for suspecting that the very looseness of the test may have the result, not of preserving orthodox thought, but of making absence of thought the rule.

A second consequence of "penalizing nonconformity, originality and independence" is that talented men who otherwise would work in the various branches of science will be diverted into intellectual boondoggling. Already, he contends, this effect is manifest in government service and in university research.

Arguing that totalitarian countries, like Japan, Germany, Italy, and Russia, have made mistakes caused by the stifling suppression of criticism in those countries, Commager's position is that:

> By denouncing as Communists or traitors those who gave us unpalatable advice, we have, in a sense cut ourselves off from unpalatable advice. But that is the kind we need—almost the only kind we need; the other kind we can work up for ourselves. And the moral here is plain. If we penalize critics we shall cut ourselves off from criticism. If we cut ourselves off from criticism, we are likely to make mistakes. If we wish to avoid mistakes, we must create an atmosphere that encourages criticism. (p. 31)

Ours, he says, traditionally has been a different policy. Because we have been able to tolerate criticism and errors we have been able to avoid the mistake of enforcing conformity to dogma and of punishing criticism. This first essay of Commager's concludes that the fate of Western civilization rests largely on us.

> If we falter here, if by silencing inquiry and criticism we fall into serious error, the whole of civilization as we know it may go down with us. We must use all our resources and use them wisely. And of all our resources, the richest are in the minds and the spirits of free men. These we must not fritter away. (p. 37)

The other chapters of this well-written little book develop other facets of the freedom-problem: "The Necessity of Experimentation," "Free Enterprise in Ideas," "Guilt by Association," and "Who Is Loyal to America?"

What has Commager's argument to do with TV? As we suggested earlier, under settled radio law the broadcaster has an obligation to carry a balanced presentation on controversial issues. In the light of Commager's argument, broadcasters might ask themselves whether they have discharged this obligation adequately. For example, have they presented the case against, as well as the case for censure of Dr. Oppenheimer for having opposed the development of the H-bomb? Indeed, have they by omission of thoughtful treatment of the Oppenheimer incident contributed toward the "serious error" of silencing inquiry?

Is the Supreme Court in fact the palladium of our liberties? One hundred and one years ago in *Marbury v. Madison* the Court initiated the policy of judicial review under which it undertook to strike down acts of the legislative and administrative branches of

the federal government and certain acts of the state governments when it found such acts violative of the United States constitution. A group of distinguished lawyers, themselves experts in constitutional law, have written an appraisal of this century of judicial review, in *Supreme Court and Supreme Law*. This book is the outcome of a series of meetings held at the School of Law, New York University. Whether it is for this reason—that the material was largely talked until it was clear—or whether the authors are unusually good writers, the resulting book is very readable by laymen as well as lawyers.

In a review article space will not permit adequate coverage of the various chapters in which different authors review the several aspects of judicial review. We do, however, find a careful and systematic treatment of the "Review and Basic Liberties" in Chapter V, by John P. Frank. It sheds light on the thesis of Commager's book. In Frank's summation we find support for Commager's conviction that freedom of speech and other human rights must be argued for and fought for by individual citizens on practical and idealistic bases if they are to continue to exist. We should not, we are told by both men, depend on the Supreme Court to defend these liberties. Frank's review of the Court's performance in this field finds that the Supreme Court has not yet invalidated (in 150 years) *any* substantial restriction on liberty by Congress. As he puts it,

> . . . the actual overt exercise of judicial review of acts of Congress has been of almost negligible good to civil liberties, and has probably harmed those liberties more than it has helped them. (p. 129)

Against this indictment, he poses the conclusion that judicial review has indirectly increased the prestige of the Court and thus rendered it more effective in protecting basic liberties where judicial review of Congressional acts is not involved. It has also, he finds, been a "vital and useful link in fostering helpful review of state actions." (p. 129.) Over-all, he concludes,

> Any benefit to basic liberties from judicial review has been slight. The system of judicial review . . . has at the very best been a near failure. (p. 130)

The discrepancy between the legend of the Court's function and the reality, Mr. Frank attributes to a number of facts. In the very beginning the founding fathers expected more of the Constitution and the Court as protectors of liberty than was reasonable to expect. Disillusion with those rosy hopes set in over the Alien and Sedition Acts. With these acts dead and behind him, Jefferson said:

> . . . It is still certain that tho' written constitutions may be violated in moments of passion or delusion, yet they furnish a text to which those who are watchful may again rally and recall the people; they fix too for the people principles for their political creed. (p. 131)

More immediately, Frank concludes that experience has shown that any five or nine appointive officials cannot resist very long the pressures of public opinion persistently asserted against them. Granting that the judges are more like a gyroscope than a pilot, he says, however, that "for all this great limitation, the judges can slow the speed and soften the force of repressions. This is within their power, though they have never done it." (p. 132) Concluding that judges are human and share the majority opinion to some degree, he yet hopes that they may adopt certain concrete proposals which he advances. Each of the proposals is within the discretion of judges to put into effect, according to Mr. Frank. These it will be worth our while to summarize:

1. The Court should severely narrow the area of nonjusticiability. By this he means that the "doctrine of political questions" (political questions which the Court will not review) should be " . . . fundamentally reconsidered and slashed to the minimum." Under this heading come the reviewability of executive power in wartime (e.g. treatment of Japanese-Americans in World War II) and " . . . review of the power of Congress to deport a particular alien under a retroactive statute making offenses out of acts which were licit when they were performed . . . " (p. 132).

2. The doctrine of standing to raise constitutional questions should be completely reviewed and changed insofar as basic liberties are concerned.

> . . . so that the Court, instead of avoiding the Madisonian responsibility of becoming an "impenetrable bulwark" against invasions of First Amendment rights, may welcome the opportunity to do its most magnificent duty. (p. 133)

3. The Court, as suggested by Justice Stone, should eliminate the "presumption of constitutionality" doctrine in cases involving basic liberties. Instead, in that area it should presume Congressional acts to be unconstitutional.

> Utilization of the presumption of constitutionality reduces all constitutional issues to a question of "reasonableness" and then upholds the law if the legislature is found to have had any "rational basis" for its action. It would surely have surprised Madison to have learned, when he designed an institution to resist "every encroachment" on the Bill of Rights, that he had done no more than set up a psychiatric institute for an occasional grand inquest into the mental stability of the Congress. (p. 133)

4. The definition of criminal punishment should be revised in relation to the Bill of Rights. The Court continues to apply the Bill of Rights only to punishments in the form of fine or imprisonment pursuant to decrees of courts. Yet as Mr. Frank says, "In 160 years, our society has devised numerous new methods, brought to a high

polish in the past fifteen years, for punishing without the use of criminal sanctions." (p. 134) And he gives as examples the punishment inflicted pursuant to Congressional hearings, and administrative actions by the federal government in deporting aliens. He reminds us that

> The most famous line in Magna Charta pledges due process of law not only for him who is imprisoned or outlawed or exiled, but also for him who is in any other way destroyed. (p. 135)

What has Frank's point of view to do with TV? In the context of the broadcaster's obligation to carry a balanced treatment of controversial issues, and on the assumption that there is at least a current issue concerning the proper scope of the protection afforded by the Bill of Rights, have any of the ideas presented by Frank had a hearing over the broadcaster's station? Has the Fifth Amendment, for example, ever been judiciously considered for the information of the public. Has the performance of Congress and the Supreme Court in relation to this and other parts of the Bill of Rights ever been reviewed for the benefit of the TV audience?

Historical reference to the origins of our civil liberties naturally calls to mind the third of the books to which we referred earlier, Zechariah Chafee's, *How Human Rights Got into the Constitution.* This little book contains the text of the Gaspar G. Bacon lectures for 1951-52 at Boston University. Professor Chafee's examination of the immediate origins of the Bill of Rights in the last quarter of the 18th Century yields a provokingly obvious conclusion: the founding fathers were so closely in agreement on the purpose and spirit of the Bill of Rights that they spent precious little time debating them.

After all, when they all felt the same way, why should they use valuable time in the convention discussing them. In some 75 beautifully written pages, Chafee proceeds to unravel backwards the skein of historical development which produced these human rights. His search takes him back through the Continental Congress, the early State Constitutions and into the English background. In that context he examines the colonial charters, and salient features of English history in the 17th Century.

In his appraisal of the intent of the founding fathers there is nothing inconsistent with the viewpoint so ably advocated in recent years by Alexander Meiklejohn. This is the view that the United States Congress is forbidden by the Constitution from *legislating* enfringements of freedom of speech, assembly, *et al,* but even more, that it is forbidden from *investigating* in those areas. The argument rests on the proposition that the federal government's powers are only those specifically delegated to it by the people through their

state governments, and that the history of 18th Century America makes it plain that the American people never vested power to infringe their personal liberties in their state governments or the federal government. Indeed, Chafee quotes one of the few articulate statements on the subject from an address written by the Continental Congress to the inhabitants of Quebec which endeavored to persuade them to send delegates to Philadelphia. In talking to them, the founding fathers necessarily had to state their policy on important issues. Here is what they said about freedom of the press:

> 'The importance of this consists, besides the advancement of truth, science, morality, and arts in general, in its diffusion of liberal sentiments on the administration of government, its ready communication of thoughts between subjects, and its consequential promotion of union among them, whereby oppressive officers are shamed or intimidated, into more honourable and just modes of conducting affairs.' (p. 15-16)

What has Chafee's point of view to do with TV? If it be conceded that broadcasters have an affirmative obligation to treat controversial issues in balanced fashion, and if the Bill of Rights is such an issue today, how can the legislative intent of the writers of the Constitution (as Chafee has dug it out) fail to provide helpful insights for the viewing public? Within the program resources of TV broadcasters, especially those associated with educational institutions is there not the capacity for bringing to the public ideas such as Chafee's? Did not the example of *The Jeffersonian Heritage Series* of programs, produced by the NAEB and financed by the Fund for Adult Education of the Ford Foundation, offer some sort of model along this line which can be followed and even improved upon?

An ironic and pungent view of the present state of freedom of speech and related liberties is provided by Elmer Davis' *But We Were Born Free.* Here we find in six adroitly written chapters both a moral and intellectual indictment of the antics of the investigating committees and "the ex-Communist puppets who dance before them, trying to put history into Doublethink" as the jacket puts it. While the book is current—as current as the Bricker amendment and the controversy concerning Harry Dexter White—it is in no sense a compendium of Mr. Davis' radio commentaries. Rather it is a synthesis of his interpretation of current events from the vantage point of his personal observation.

The flavor of this trenchant book may be sampled from the first essay, "Through the Perilous Night," in which Davis somewhat ironically surveys the state of political and intellectual intolerance. He asks who is behind this attack which is active at the

municipal, state, and federal levels. He doubts that there are many Fascists, but thinks there are many who could be called "Fascistoid." He believes that among them are McCarthyists, isolationists, "politically ignorant economic conservatives who see no difference between Socialism and Communism"; Asia-Firsters, the China Lobbyists, antifeminists. While these people have some kind of rationalization and a great deal of money for their attacks, the bulk of the individuals who support them are money-less people with "nothing that could be called ideas; but plenty of emotion." (p. 21) These people, who are similar to the mass membership of the Ku Klux Klan of a generation ago, are dominated by a surface emotion of hatred, underlying which are "appalling ignorance" and fear.

According to Davis the Communist Party membership has declined precipitately in the past few years. Conceding that Communism in Russia is a danger, Mr. Davis asserts that the tiny Communist Party in the United States is less a danger than it is an asset

> . . . in the minds of many of our public men; it provides them with a cover for attacks on liberalism and progressive reforms—attacks which might have less hope of success if they had to be made honestly, out in the open; and, quite as important, it enables them in denouncing Communism to find the road to publicity and power. (p. 82)

When he has rounded up the current evidence on anti-intellectualism and its cousins, Davis offers a policy for the defenders of freedom:

> Don't let them scare you. For the men who are trying to do this to us are scared themselves. They are afraid that what they think will not stand critical examination; they are afraid that the principles on which this republic was founded and has been conducted are wrong. They will tell you that there is a hazard in the freedom of the mind, and of course there is, as in any freedom. In trying to think right you run the risk of thinking wrong. But there is no hazard at all, no uncertainty in letting somebody else tell you what to think; that is sheer damnation. Judge Learned Hand . . . acknowledges the hazard and has the answer to it. 'God knows there is a risk in refusing to act until the facts are all in; but is there not greater risk in abandoning the conditions of all rational inquiry? Risk for risk, for myself I had rather take my chance that some traitors will escape detection than spread abroad a spirit of general suspicion and distrust, which accepts rumour and gossip in place of undismayed and unintimidated inquiry . . . ' This nation was conceived in liberty and dedicated to the principle—among others—that honest men may honestly disagree; that if they all say what they think, a majority of the people will be able to distinguish truth from error; that in the competition in the market place of ideas, the sounder ideas will in the long run win out. For almost four years past we have been engaged in a cold civil war—testing whether any nation so conceived and so dedicated can long endure. (p. 114)

The question, Mr. Davis seems to be saying, is whether we can or will put up with this kind of subversion of our constitutional lib-

erties in the name of anti-communism without losing the uniquely American system of government.

Here we have touched only on the first chapter of *But We Were Born Free.* In others he deals with the Bricker amendment and related efforts to revise the Constitution to the advantage of the wealthy; the ethics of newspapers in covering Congressional investigations; the arrogance of popular ex-Communists in presuming to rewrite the American history of the past 25 years in the image of their own distorted personalities; and two reflective chapters of a more personal character, "Grandeurs and Miseries of Old Age" and "Are We Worth Saving and if so, Why?" The whole comprises the first book from Elmer Davis in 14 years. This honored commentator and public servant (he headed the Office of War Information in World War II) will find this book used widely and well.

How does Davis' book relate to TV? In Elmer Davis, broadcasters may find moral support for operating stations which are in fact as well as in theory "market places for ideas." They know that he comes to his views from their own ranks and that he is as devoted to the cultural and political traditions of the United States as truly as they, themselves are.

If Davis wrote an ironic and witty book, our fifth is an angry book. Bishop G. Bromley Oxnam calls it *I Protest.* And he does. His protest is based on his experience with the House Un-American Activities Committee, culminating in his 10 hours in the witness chair. As he says in his preface, the book

> . . . is concerned with procedures that repudiate American tradition and practice, procedures that involve the informer, that riddle our life with distrust, that set American against American, that tend to label sound reform as subversive, that make no distinction between progress and revolution, procedures carried on by staffs too largely composed of ex-Communists and often incompetent, or by politicians some of whom appear prone to capitalize upon hysteria for political advantage.

Conceding that the Communist Party is a conspiracy, Oxnam's protest centers on the practices of the Congressional Committees and their supporters through the country. The focus of his protest is the informer upon whom the attack on freedom of speech depends. He calls the informer

> . . . a man of shadows, born of fear and contributing to it. . . . He is not subpoenaed, answers no roll call, dares not face the man he accuses. He is as un-American as the Nazi gauleiter or tre Russian commissar. . . . Those who employ him or sustain him insist there is no fear upon the American campus; no fear in the government service; no fear in the motion picture, the television or radio industry; no fear in the church; in fact no fear at all except as it is conjured up by the liberals who are alleged to be unaware of the Communist threat to freedom.

> This denial of the presence of fear is as false as the presence of fear is a fact. . . . The American is holding his tongue. If this were due to more serious thought, it would be well. But it is due to fear. Communism can never be answered by fearful people who stand silent. And strangely enough this fear results in large measure from the un-American Activities of elected representatives of the American people who have been charged with "investigating" subversive activities. (p. 6)

What has Oxnam's book to do with TV? If men in America today are afraid of informers, must the TV broadcaster not be less afraid than others if he is to carry his honorable responsibility to maintain a forum for the free pursuit of truth concerning controversial issues? Generally the press and radio and TV too have reported the testimony of informers before investigating committees and courts without reporting the less savory information available as to their backgrounds. To this extent these media have contributed, unintentionally in most cases to be sure, to the growing acceptance of informers by the public. Both Davis' and Oxnam's books may be interpreted by the broadcaster as encouragement to discard this "sacred cow" status for the informer and to treat them in news programs with the same candor that would be accorded other news objects.

RESEARCH ABSTRACTS

COMICS

SPIEGELMAN, MARVIN; TERWILLIGER, CARL; and FEARING, FRANKLIN. "The Content of Comic Strips: A Study of a Mass Medium of Communication." *The Journal of Social Psychology* **35:37-57; February 1952.**

Purpose: To study, by means of content analysis, three major questions regarding Sunday comic strips: (a) To what extent do comic strips depict "reality"? (b) How do comic strips depict ethnic groups? (c) What is the place and significance of animals in the comics?

Sample: The sample for the present study consisted of a three-week period of the Sunday comic strips represented by *Puck, the Comic Weekly* and the metropolitan group of Sunday comic sections. These two syndicates were selected because they comprise practically all the Sunday comic sections sold nationally in the United States. A total of 52 comic strips were analyzed.

Procedure: Definitive categories and criteria for judging the comic strips were developed. Reliability indices were calculated for judgments on each of the criteria with reliability coefficients ranging from .78 to 1.00. Four graduate students in social psychology and four nonstudents, all of whom were college graduates, served as judges.

Results: (a) There was a slight preponderance of humor strips over adventure strips (58 percent to 42 percent). (b) Comics are "skewed toward reality" in that they have to do more often than not with contemporary urban and rural settings in the United States. (c) The real-irreal dimension is a function of two variables: situation and caricature, which are inversely related—when the situation is "real," the people in the strips tend to be "irreal" and, conversely, if the situation is remote, the people usually will be "real." (d) The comics do reflect cultural patterns of acceptance and rejection regarding ethnic groups. (e) Animals appear in 50 percent of the strips and are particularly important in humor.—*John Molstad.*

SPIEGELMAN, MARVIN; TERWILLIGER, CARL; and FEARING, FRANKLIN. "The Content of Comics: Goals and Means to Goals of Comic Strip Characters." *The Journal of Social Psychology* **37:189-203; May 1953.**

Purpose: To study, by means of content analysis, the goals sought, the goals approved and disapproved, and the means used in achieving these goals by comic strip characters.

Sample: The comic strips analyzed consisted of a three-week sampling of 52 nationally syndicated Sunday comic strips.

Procedure: Definitive category-sets such as Sympathy, Role Importance, Comactor Unit, and such were developed together with the criteria for their judgment. Judges were asked to analyze the comic strips in terms of these category-sets and their criteria and to choose the two most important goals and the two most important means of achieving these goals for each character.

Results: (a) Over twice as many male as female characters are found in the comic strips analyzed. (b) Ambiguous attitudes toward the status of women are reflected. (c) Both sexes highly prize altruistic, group oriented goals; but an ambivalent attitude is indicated in that self-oriented goals, although disapproved, are frequent. (d) A greater proportion of female characters is in the upper-middle and upper socio-economic classes than male characters, and a correspondingly larger proportion of the males is in the lower-middle and lower classes. (e) Data on goals and means of the males of the various socio-economic classes indicate that the upper class is generally humanitarian in both goals and means, the middle class seeks self- and power-goals using aggressive means, and the lower class seeks both altruistic and personal goals depending on fate and charm as means. (f) Goals and means of the females of the various classes indicate a greater concern of the upper class with being loved and lovable, the tendency of the middle class to achieve career recognition by hard work, and the tendency of the lower class to serve others and accept their fate.—*John Molstad.*

WOLF, KATHERINE M. and FISKE, MARJORIE. "The Children Talk about Comics" in *Communications Research, 1948-1949;* 3-50; edited by Paul F. Lazarsfeld and Frank N. Stanton. New York: Harper and Brothers, 1948.

Purpose: To secure from a small, representative sample of children between seven and 17, reports about their comic book reading experience and to get from these reports some impression of the motives for and effects of comic book reading among different children.

Sample and Procedure: Detailed interviews were held with a sample of 104 children, carefully stratified according to age, sex, and economic status.

Results: (a) Normal children need various kinds of comics at different stages of development with animal comics providing objects for their early projective needs, and later, invincible comic book heros supplying objects for ego-inflation. (b) In regard to providing identification objects, present-day comics meet the developmental needs of today's children for identification objects more effectively than did the literature available to the past generation. (c) The normal child is a "moderate reader" who uses comics as a means of

ego-strengthening, first through projection; later, through identification with an invincible hero; and finally, as a tool for the real adventure of life itself. (d) The maladjusted child turns to the comic book as a means of satisfying an intense emotional need for self-assurance. (e) Extensive comic book reading must be considered a symptom rather than a cause of maladjustment. (f) For over 90 percent of the children interviewed, parental interference had no effect whatever, while in a small minority it produced a shifting, but no basic change, in the psychological pattern characteristic of comic reading. (g) Home atmosphere did seem to be a basic factor in determining whether a child would become a moderate reader or a fan.—*John Molstad.*

TELEVISION

STOVER, ROBERT E., and TEAR, DANIEL G. "Evaluation of Two Kinescopes." Technical Report SDC-269-7-38. Instructional Film Research Program, Pennsylvania State College, October 1953. (Copies may be purchased from Department of Commerce, Office of Technical Services, Washington, D. C., 50c.)

Purpose: This research was conducted to determine if the effectiveness of two kinescopes differed from that of two conventional training films.

Procedure: "Fifteen Naval Reserve Officers of the Volunteer Naval Reserve Research Company of The Pennsylvania State College took part in a program to determine the value of two kinescopes as training media relative to conventional training films. Employing a rating form now being developed by the Instructional Film Research Program, a panel of 12 of these officers gave each of the two kinescopes a rated score which is above the mean rated score of the conventional films which they have considered. A further analysis was made to determine the effectiveness of each part of the film in communicating information." This was done by means of the Film Analyzer which furnished a continuous record of the judged effect of each portion of the film.

Results: "The two kinescopes were rated to be at least as effective in the communication of information as the average training films that had been studied."—*Edmund Faison.*

TRAINING EQUIPMENT

MILLER, R. B. "Handbook on Training and Training Equipment Design." Wright Air Development Center Technical Report 53-136. 339 p. June 1953.

Purpose: "The *Handbook* was prepared . . . for the purpose of determining the psychological requirements of training devices with an aim to making recommendations for the design of these devices . . . [and] is the result of an attempt to provide specialists in human training with information and guiding principles."

Procedure: This work was originally meant to be a documentary review of the literature. However, the incompleteness of the literature on learning theory applicable to complex skills persuaded the author to formulate and include a large amount of psychological theory. Many cited principles are only

indirectly supported by empirical evidence and are to be considered as "best guesses." The *Handbook* is organized around three training problems: (a) how to present to the student knowledge of results so as to maximize the benefits from practice; (b) how to simulate tasks, psychologically, so that what is learned in one task environment will positively transfer to another task environment; and (c) how to get a student to *want* to make the responses which constitute learning.

Results: The following principles represent a very small sample from a wealth of hypotheses, principles, and suggestions applicable to many training situations put forth by the author.

1. "Provision should be made for occasional self-pacing of tasks without time stress on the student. Discontinuous tasks should benefit more from such occasional trials than continuous tasks."

2. "When work is performed on a machine, there will be some motivational value if the machine gives back some form of response. This closure should be given on every trial. This truism suggests that the provision of *artificial* learning feedback for a task which has inadequate *operational* learning feedback acts also as motivational feedback."

3. "No more than relatively crude operating mock-ups of the operational situation are required when the principal problem of the student is to learn simultaneously to change direction quickly and efficiently in the various dimensions required in a complex coordination task. Rough approximations of the ranges and ratios of control-display relationships may be made in this simple device."

4. "Training on such a simple device (principle 3) which does not simulate (from a psychological standpoint) the dynamics of the operational equipment should be discontinued (a) after the student shows no errors or hesitation in manipulating the controls for proper direction with small reaction times even for simultaneous coordinated action, and (b) before the student develops major dependencies on these artificially simplified perceptual aspects of action feedback of the task."

5. "If every trial on the training device is scored from an evaluational viewpoint, and if the student realizes that this scoring is "for keeps," he may be so occupied with trying to perform well that he may learn little. In other words he may respond solely to action feedback of the task and ignore learning feedback. It is therefore recommended that, during the stage of learning the ranges and magnitudes of control and display (equipment) movement, evaluational scoring be incidental, informal, or even nonexistent. Even in later stages of learning, it seems unwise to score "for keeps" every trial. Evaluation of student performance should never prohibit training."

6. "By building a training device which performs in a more standard manner (less variability) than a given piece of equipment is likely to perform, we risk a biased training of the student by shielding him from ranges of machine variation which contribute to the performance of the task in operations."

7. "The student should *over-learn* the nomenclature of the displays and controls of the equipment. This process can be initiated by the use of pictures and diagrams, and be continued with no more than nonfunctional mock-ups of the operational or training equipment. It is inefficient to begin practice on a complex training device until nomenclature appropriate to training and operations has been 'over-learned'."

8. "The student can be induced to accept less realism in a training device, to the extent that indoctrination is provided him."—*Edmund Faison.*

FILMS

INSTRUCTIONAL FILM RESEARCH PROGRAM. "A Bibliography of Production, Utilization, and Research on Instructional Films." *Technical Report SDC-269-7-40. Pennsylvania State University, November 1953. (Copies may be purchased from Department of Commerce, Office of Technical Services, Washington, D. C.)*

Purpose: To provide a comprehensive list of references relating to production, utilization, and research on instructional films up to the early part of 1952 in the hope that it will be useful to professional people in the mass communication field, to research workers, and to students.

Procedure and Results: This bibliography alphabetically lists approximately 1950 references, including some studies in areas which are indirectly related to instructional films, such as, radio, music, learning theory, research methods. While its usefulness is somewhat limited by the alphabetical listing (the authors state that they hope to publish a subject-matter cross-reference list) it should prove highly useful to workers in the instructional film field.—*Edmund Faison.*

McTAVISH, C. L. Effect of Repetitive Film Showings on Learning. *Technical Report SDC-269-7-12. Special Devices Center under contract with the Instructional Film Research Program at Pennsylvania State College, November 1949.*

Purpose: To determine the increment in learning that may be attributed to *repetitions* of an educational film.

Procedure: Four groups of college freshmen (319 students) in a science survey class were each shown four general science films. Each group saw one of the films once; a second film, twice; a third, three times; and a fourth, four times. A film was shown the required number of times in one class period and the test on that film was given at the next period.

Results: "In every case the difference between the pre-test and post-test scores was highly significant, indicating that every group learned from each film. Analysis of the learning gains attributable to each additional showing of the films indicated that the first *repetition* (i.e. two showings) resulted in substantial increments in learning. Three showings failed to add materially or significantly to the learning effected by two showings. Four showings resulted in an even smaller increment, or in two cases a slight decrement, over three showings."—*Edmund Faison.*

ASH, P. and JASPEN, N. Optimum Physical Viewing Conditions for a Rear Projection Daylight Screen. *Technical Report-SDC-269-7-37. Special Devices Center under contract with the Instructional Film Research Program at Pennsylvania State College, October 1953.*

Purpose: To study the effects on learning of (1) viewing angle, (2) distance from the screen, and (3) room illumination as these apply to the use of the rear-projection, cabinet type, 16mm movie projector.

Procedure: A nine-minute film on assembly of the breechblock of the 40mm antiaircraft gun was shown to groups of Navy trainees seated at systematically varied angles and distances from a cabinet-type projector screen. The film was shown under normal daylight illumination and in a darkened room. Learning, objectively measured by a performance test, was related to angle of view, distance from screen and room illumination. It was possible to determine the relationships among distance, angle and amount of light.

Results: "There is an optimum area for viewing [a] rear-projection screen. This area includes a cone 60° wide (30° to each side of a center line perpendicular to the plane of the screen) and 18 feet deep (12 screen widths). Performance of trainees who sat within this sector was better than performance of trainees who sat outside of it.

"In the optimum area (up to 30° eccentric, up to 12 screen widths) performance is better under conditions of daylight; outside these limits, performance is better under conditions of darkness. Increasing the distance from the screen results in sharper loss in performance than increasing the angle of view, and the relative loss is greater under daylight viewing conditions than under darkness . . . .

"The findings of this study would seem to be relevant to the viewing of television, where size of screen and viewing conditions are comparable to those of the [cabinet projector]."—*Edmund Faison.*

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